

INDUSTRIAL HYGIENE DIGEST

Literature Abstracts

- MEDICAL
- ENGINEERING
- LEGAL - - - decisions and trends

Industrial Health News

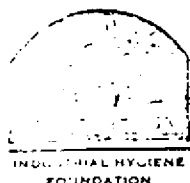


Issued Monthly By

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 combined research and service institution to protect the health of workers in industry.

Vol. 5.

June, 1943

No. 6.

Combating Absenteeism from Illness and Injury

Illness and Non-Industrial Injury	8.85 days lost per employee per year
Industrial Injury	0.89 days lost per employee per year
Occupational Disease	0.01 days lost per employee per year
TOTAL	9.45 days lost per employee per year

Industrial health hazards, multiplied by war production, are a cause of sick absenteeism. One practical measure for cutting this manpower waste is the industrial hygiene survey, which helps maintain healthful working conditions. First step in a survey is an overall appraisal to locate processes, materials, products or conditions, including sanitary facilities, that may adversely affect health.

Second, where possible hazards are noted, the exposure is measured to determine whether it exceeds the safety limit.

Third, if a hazard exists, practical, precautionary measures are devised, such as segregation or inclosure of a process, proper ventilation, use of wet methods, improved housekeeping, personal protective equipment.

Fourth step is maintenance, periodic checks on the efficiency of the control measures.

Throughout this procedure competent medical supervision is of top importance.

Nuisance Exposures in the Workplace

Many an exposure to dusts, fumes, gases, etc., in the workplace, while not a real health hazard, may be a sore spot in management-labor relations. Obnoxious odors and unpleasant dusts are a source of employee dissatisfaction, and understandably so. Nuisance exposures can usually be controlled through good industrial hygiene practice. Results are better working conditions and a safer shop. (Exposures, especially those which obscure vision, are a cause of accidents.)

Maryland "O.D." Law Amended: Under a new amendment to the occupational disease law, Maryland can now enforce rules and regulations for control and prevention of occupational disease. Violations are subject to \$100 a day fines. For details see page 3 of the Foundation's June INDUSTRIAL HYGIENE DIGEST.

New Members and Subscribers: Pullman-Standard Car Manufacturing Co., joined the Foundation recently. Meanwhile, in the non-industrial category, the following have subscribed to Foundation publications:

Tennessee Valley Authority
Ohio Department of Health

Lt. (j.g.) S. DiLustro, U.S.N.R.
British Ministry of Supply Mission

. . . - Keep War Workers Well . . . -

004150

June, 1943.
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Industrial Hygiene Foundation,
4400 Fifth Avenue,
Pittsburgh, Pa.

INDUSTRIAL HYGIENE DIGEST
Literature and News

News Items

517 Occupational Diseases

The Connecticut Bureau of Industrial Hygiene reports 145 occupational disease cases for the month of April, 1943. Ninety per cent were from dermatitis with oils being responsible for 105 cases. Silicosis and pneumoconiosis totaled 10 cases, lead poisoning 1, radioactive compounds 1 and arsenic compounds 1.

518 Flame Proofing Mixture

A flame proofing mixture has been suggested for treating fabric to reduce fire hazards. The solution has not caused dermatitis in the cases used to date. The formula is:

9 lbs. ammonium acid phosphate
9 lbs. ammonium sulfate
82 lbs. of water.

519 Dust and Pneumonia

Working at one of the dusty trades may, contrary to what might be expected, lessen rather than increase susceptibility to pneumonia. This possibility appeared in a report by Dr. Anna M. Baotjer and Dr. Frederick J. Vintinner, of Johns Hopkins University School of Hygiene and Public Health, at the meeting of the American Industrial Hygiene Association in Rochester, N. Y. Experiments with rats furnished the basis for this view of pneumonia susceptibility in relation to certain dusts. The scientists caution against applying the results too definitely to man until more is known. -- Science News Letter, June 5, 1943.

520 Danger of Lead Poisoning Among Shipbreakers

Shipbreakers and other workers engaged in cutting structural steel that has been covered with lead-bearing paint are in danger of getting lead poisoning, Dr. Irving R. Tabershaw, Benjamin P. W. Ruotelo and Robert P. Gleason, of the Massachusetts Division of Occupational Hygiene, warned at the meeting of the American Industrial Hygiene Association in Rochester, N.Y. "Neither the use of respirators nor natural ventilation provides complete protection," these scientists found in study of a group of 14 men engaged in salvaging an old elevated railway structure. Oxyacetylene cutting was used exclusively on this job. A sample of scrapings from the girders contained 7% of lead. All of the workers used

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approved respirators for protection against the poisonous metal fumes but during the course of the salvage operations nearly all of them were ill at one time or another with some slight or major symptoms of lead poisoning. Rotation of workers to other jobs to avoid dangerously long exposure to lead is advised by the Massachusetts scientists. -- Science News Letter, June 5, 1943.

521 Circular Describes Carbon Monoxide.

The Bureau of Mines has published a circular describing protective measures which should be taken in the home to minimize dangers from carbon monoxide and methods of treating persons affected by it. The hazards of carbon monoxide have increased greatly since the war because of the shortages of certain fuels, causing many persons to experiment with substitute fuels, said Dr. R.R. Sayers, director of the bureau. The circular, "Danger from Carbon Monoxide in the Home," is written in non-technical language by H.H. Schrenk, chief chemist in the Bureau's Health Division, and L.B. Berger, chemist in the Bureau's Central Experiment Station at Pittsburgh, Pa. - Victory Bull., (May 26, 1943).

Legal Developments

- 522 Bronchiectasis Caused by Breathing Dust-Filled Air. Ordinary Usage of Appliances as Test of Negligence. Reasonable Care to Make Place Safe for Employees Necessary. Appellee, an employee of appellants, manufacturers of ax handles, quit work because of illness which has since been diagnosed as bronchiectasis which is a disease causing dilation of one or more of the large bronchial tubes. He brought this action against appellants to recover damages for his illness and disability alleging that the room in which he was required to work was filled with a fine, powdery dust, caused by the manufacture of ax handles, that completely filled the air, the breathing of which caused him to develop tuberculosis, sinus trouble and bronchiectasis, and that he did not know such dust was injurious to his health, but that appellants did know of this danger or, by the exercise of ordinary care could have known it. He further alleged "that said unsafe place in which this plaintiff was required to work -- was the sole proximate cause of the injuries to this plaintiff's health above described." The master is not an insurer of the safety of his servant, and the utmost of his duty is the exercise of reasonable care. Employers are liable for the consequences, not of danger, but of negligence; and the unbending test of negligence in methods, machinery, and appliances is the ordinary usage of the business. No man is held by law to a higher degree of skill than the fair average of his profession or trade, and the standard of due care is the conduct of the average prudent man. The law does not impose the burden on the master of making the servant's place to work safe or reasonably safe. If the place is not reasonably safe, still there is no liability on the part of the master if he has used reasonable care to make it reasonably safe. Since the undisputed proof shows that appellants had exercised reasonable care to make appellee's place reasonably safe, they were not guilty of negligence as alleged, and the court should have directed a verdict in their favor. The judgment reversed and cause dismissed. Esaye v. Odom. Ark. Supreme Ct. Decided March 8, 1943. (CCH).

223 Maryland Occupational Disease Law Amended.

A recent amendment to the Maryland Occupational Disease Statute includes the following:

"It shall be the duty of the State Department of Health, and of the Commissioner of Health of Baltimore City, concurrently:

"1. To receive reports of occupational diseases from physicians who have knowledge of such cases.

"2. To study occupational diseases and ways and means for their control and prevention, and make the necessary rules and regulations for such control and prevention. Such rules and regulations for the control and prevention of occupational diseases shall have the force and effect of law. No such rule or regulation or any modification, amendment, or repeal thereof, shall become effective until public notice of such proposed rule or regulation, modification, amendment, or repeal thereof shall have been given, and a public hearing thereon held before the State Board of Health. Any person, firm or corporation failing, refusing or neglecting to comply with any rule or regulation made by the State Department of Health and the Commissioner of Health of Baltimore City, under the powers conferred upon them by this Section, shall be guilty of a misdemeanor, and upon conviction, shall be fined not more than One Hundred Dollars (\$100.00) for each day that such violation continues, provided that a written notice of such rule or regulation shall be served on some person in charge of the place where such violation exists prior to any prosecution for violation of any such rule or regulation. (As amended by L. 1943, Ch.443, effective June 1, 1943).

"3. To investigate industrial conditions causing occupational diseases, or which may be suspected of causing occupational diseases, and make recommendations for the control of such condition.

"4. To enforce regulations regarding occupational diseases.

"5. To recommend to the Legislature for enactment such measures, including additions to the list of occupational diseases contained in Section 34 of this Act, as their studies and experience may demonstrate to be advisable."

Theodore C. Waters, of the firm of Mullikin, Stockbridge & Waters, Baltimore, and Chairman of the Legal Committee of Industrial Hygiene Foundation, makes the following comment:

"By virtue of the foregoing amendment (Chapter 443 of the Public Laws of Maryland, 1943) the State Department of Health and the Commissioner of Health of Baltimore City are empowered to enforce rules and regulations for the control and prevention of occupational diseases. Violation of rules and regulations is thereby made a misdemeanor with a fine of \$100.00 for each day that the violation continues."

Silicosis Alba Dolens. Resulting from Pneumonia Suffered by Store Employee.
Due to Changing Temperatures in Building in Course of Employment. Lack of
Proof to Show Proximate Cause.
Petition for writ of certiorari denied. Mesecall v. W.T. Grant Company. U.S.
Supreme Ct. (Ind.) (CCH).

Death Caused by Silicosis. Temporary Employment During Disability.
Decedent became disabled in 1938 and his death two years later was caused by a
lung disease in the nature of silicosis. The disease was contracted in the course
of his employment. The award was made pursuant to the Workmen's Compensation Law.
There was paid to the deceased employee, during his lifetime, \$1550.00. Upon his
death the Board made an award of \$1600.00, representing death benefits, to the
widow and child. The proof shows that from the date of disablement the de-
ceased suffered continuously from silicosis and died as a result of that disease.
The sole contention of appellants is that for two months, in 1939, the decedent
was employed as a W. P. A. worker. His regular wages, which he received from his
employer, were \$19.75 a week. From the W. P. A. he received \$12.10 a week. From
the time of his disablement until his death the deceased employee was not able to
earn any wages at the work at which he was employed by the employer. Award
affirmed. Mooney v. Witherbee Sherman Corp. et al. N.Y. Supreme Ct., App. Div.,
3rd Dept. Decided January 13, 1943. (CCH).

Book Reviews

- 116 The Essentials of Industrial Health. C.O. Sappington. J.B. Lippincott Company,
Philadelphia, Pa. 626 pp. (1943). \$6.50.
This excellent book presents the subject of industrial health in a lucid manner.
Part I deals with the origin and development of industrial health, occupational
morbidity and mortality, the distribution of industrial health service, the class-
ification of industrial physicians, and the industrial medical department.
Part II describes the field of industrial hygiene and toxicology. Industrial
health hazards are classified in 10 major groupings and the fundamentals of toxic-
ology and safe concentration codes are summarized. The need for judgment and
experience in the application of the codes is stressed. The plant survey, includ-
ing the engineering and medical assay of exposures, the control of hazardous
conditions and the maintenance requirements are described. Plant sanitation,
personal hygiene and the coordination of industrial and community health services
complete the section. Part III is concerned with industrial medicine and
traumatic surgery. The subjects discussed include: the worker and the job, the
job, industrial accidents, occupational diseases, non-occupational disabilities,
and workmen's compensation and rehabilitation. Nine appendices provide outlines
of nursing, plant surveys, material classifications, respirators, illumination,
sanitation, hospital floor plans, medical services and orders on dusts, fumes,
vapors and gases. The book is well indexed and the references to the literature
are complete. The attention of Foundation members is called to this valuable work.

- 527 Micromeritics: The Technology of Fine Particles. J.M. DallaValle. Pitman Publishing Corp., New York. 376 pp.(plus appendix) (1943). \$8.50.
Although less than 20 pages in this book are devoted to the industrial hygiene aspects of fine particles, many other technical men in manufacturing fields where industrial hygiene is an active interest will wish to be acquainted with the nature of this work. It is the first attempt to bring together "a mass of widely scattered information on methods of particle-measurement, size-distributions, packing arrangements, and a general theory concerning the physical properties of finely divided substances. Industrial applications of the subject matter are also included and every attempt has been made to present the material in a useful form." The text excludes consideration of particles of colloidal dimensions and is limited for the most part to those falling in sizes between 0.1 microns and 10^5 microns. The treatment is necessarily highly mathematical at many points and embraces such apparently unrelated (heretofore) fields as soil physics, mineral physics (e.g. ores), chemical engineering, geology (of petroleum), hydrology (silt), pigments, abrasives, ceramics and cements. "Micromeritics" was coined from Greek roots and means "the science of small particles."
- 528 Noxious Gases and the Principles of Respiration Influencing Their Action. Y. Henderson and H.W. Haggard. Reinhold Publishing Co., N.Y. 2nd Edition 294 pp. (1943).
This is one of the American Chemical Society's Series of Scientific and Technologic Monographs. In the first edition (1927) the authors presented excellent discussions of the general mechanism of respiration, the respiratory function of the blood, and the general principles governing the absorption and excretion of gases and vapors. In the present edition the same general arrangement is followed and the chapters are brought up to date. There is a slight rearrangement and considerable expansion of their classification and treatment of irritants, asphyxiants, volatile drugs, and inorganic and organometallic gases. Compressed air illness and prevention has been introduced into the chapter on simple asphyxiants. Methods of resuscitation are given considerable space, while Dr. Henderson has added a short chapter on Breathing Machines. Permissible concentrations are given appropriately and are easy to find for the index, references, and general format are uniformly excellent.
- 529 Urine and Urinalysis. L. Gershenfeld. Lea & Febiger, Washington Square, Philadelphia, Pa. 304 pp. \$3.25. (Second edition, revised 1943.)
The practical knowledge accumulated from an extensive experience in urinalysis forms the basis for this useful book. The subject is presented in 11 chapters in three main classifications, i.e., General Considerations, Urinalysis and special urinary tests. The detection of inorganic metallic poisons in urine is described in Chapter 10, entitled "Urinary Tests (either infrequently performed or of doubtful clinical value)." The method proposed for the analysis of lead in urine is of questionable value. The modern colorimetric and polarographic methods are mentioned by reference only. Other industrial hygiene techniques such as the benzol-urine sulfate test are not discussed.
- 530 Year Book of Industrial and Orthopedic Surgery. Edited by C. F. Painter. Year Book Publishers Inc., Chicago, Ill. 424 pp. (1942).
This volume is a summary of recent advances in Orthopedic Surgery. Some articles of special interest to industrial surgeons are included. Most industrial injuries require treatment of an orthopedic nature, which probably explains the inclusion in the title of "Industrial Medicine and Surgery." It is suggested that an entire volume on that subject would meet with approval as the treatment in the book under discussion is rather brief. However this edition presents many interesting articles for both the industrial physician and the orthopedic surgeon.

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- 531 War Medicine. Edited by W.S. Pugh. Philosophical Library, New York. (1942). "War Medicine" is a symposium of articles which have appeared in several journals chiefly "The Military Surgeon." Many phases of medicine associated with the war effort are discussed. Among the subjects presented in the various papers are: The treatment of burns; dangers to hearing induced by the noises of modern warfare; lung injury and abdominal injury due to blast waves; problems associated with high altitude flying and deep sea diving; allergy; fatigue in a war pilot; and nutrition of the soldier. The book is of value to the military surgeon and to the non-military physician who may be called upon to treat the major and minor injuries resulting from civilian bombing.
- 532 Climate and the Energy of Nations. S.F. Markham. Oxford University Press. 144 pp. (1942). The author disagrees with the theory of some climatologists that the focal points of civilization change in accordance with the fluctuations of climate. He is convinced, rather that one of the basic reasons for the rise of a nation in modern times is its control over climatic conditions and he asserts that civilization depends to a great degree upon climate control in a good natural climate. Following a discussion of temperature and humidity as they affect energy and health, the conclusion is made that the ideal climate rarely exceeds the 76° upper limit and does not fall so low as to demand great efforts to bring indoor temperatures up to 60° or 70°.

Industrial Health Hazards and Their Effects

- 533 The Toxicity and Potential Dangers of Aliphatic and Aromatic Hydrocarbons. W.F. von Oettingen. Yale J. Biol. & Med., 15, 157 (December, 1942). The aliphatic and aromatic hydrocarbons are considered separately and the former are divided into paraffines, olefines, cycloparaffines and unsaturated cycloparaffines. In the paraffin series the first fraction (pentane and hexane) are relatively non-toxic, having low narcotic and irritating properties. The next higher boiling fraction has more marked narcotic and irritant properties and a narrow margin of safety (difference between the minimum narcotic and minimum fatal concentrations). The lowest boiling fraction of the olefines also has narcotic properties but a comparatively wide margin of safety, while the higher homologues are more potent as narcotics and are more irritating. The lower boiling fraction of cycloparaffines has narcotic properties but is less irritating than the corresponding olefines. The higher boiling cycloparaffines and the unsaturated cycloparaffines are potent narcotics and have a narrow margin of safety. The lowest boiling fraction of aromatic hydrocarbons (benzene) has narcotic properties and produces injurious effects on the blood and blood-forming organs. The next two higher boiling fractions (largely toluene and ethyl benzene and xylene) have slightly greater narcotic and irritant properties and a smaller margin of safety. They have, however, less marked hematotoxic action. The highest boiling fraction has marked narcotic properties but is least dangerous because of the low volatility. Toxic symptoms are listed for the various hydrocarbons. Reasons for their toxic action, including a consideration of their metabolism, of the aromatic compounds are given. A helpful table listing the physico-chemical and biologic properties of the hydrocarbons is included in the article. The main difficulty encountered in determining the health hazards of hydrocarbon solvents arises from the fact that different brands of solvents have varying percentage compositions of paraffines, olefines, cycloparaffines and aromatic hydrocarbons.

The Gas Filter for Protection Against Arsines and the Control of its Effectiveness. General Remarks on Aerosols and their Most Important Properties. T. Chiotan and I. Chicos. Antigaz. (Bucharest). 14, 252-266, 293-322 (1940). (Romanian).

A review of the optical and electrical properties of aerosols and their importance for gas warfare, protection against arsines during the World War, the mechanism of the filtration of aerosols, the various types of protective filters for use against arsines and filters with mixed action (with review of the patent literature), control of the action of aerosol filters, methods of testing, rapid methods, etc. A nephelometric method is described.

335 Acute Nephritis from Exposure to Carbon Tetrachloride. A.R. Smith. Industrial Hygiene (N.Y.), 22, 171-2 (April, 1943).

A case report on a woman worker in a cellulose acetate costume jewelry plant is presented. The results of physical examination, urine and blood chemistry, and liver function tests are included. The role of individual susceptibility and the severe gastric irritation are accentuated.

336 Application of Carbon Tetrachloride-Type Fire-Extinguisher Liquid to Burning Magnesium Chips and Magnesium Incendiary Bombs. S.J. Pearce and others. U.S. Bur. of Mines Rept. of Invest., No.3386, U.S. Bur. of Mines, Washington, D.C. (February, 1943).

Two series of tests were conducted by the Bureau of Mines in cooperation with representatives of the Chemical Fire Extinguisher Association (1) to determine whether or not phosgene was formed when carbon tetrachloride-type fire-extinguisher liquid was applied to burning magnesium and magnesium incendiary bombs and (2) to determine other significant gases that might be formed under these same conditions. Steel, concrete, and wood surfaces were used to support the burning materials. Phosgene, chlorine, and the vapors of extinguisher liquid were found in all of the fire-test atmospheres, carbon monoxide was found in all but one, and hydrogen chloride was found in all but three. The results of the fire tests made in Newark and in Pittsburgh are in fair agreement, considering the many uncontrollable factors involved. The kind and amount of gases found depended mainly on the type of surface on which the burning magnesium material was supported and were not appreciably affected by the form of the burning magnesium, that is, whether it was chips or incendiary bombs. The use of carbon tetrachloride fire-extinguisher liquid on burning magnesium incendiary bombs is not recommended; but its use on fires; whether ignited by bombs or by other means, should not be discouraged, as such types of extinguishers are in widespread use and have established an excellent record in the control of incipient fires over many years.-- Authors' summary and conclusions.

337 Cancer and Toxic Gases. J.E. Pessano. Semana Med., (Buenos Aires) II, 210-214 (1942). (Spanish).

Among the products of combustion in gasoline motors some belong to the group considered to be cancerogenic. Rats respiring products of combustion of petroleum (fuel oil) at high concentration developed carcinoma of the lungs with widely distributed metastases. Ingestion of the black deposit formed by the combustion produced a papillomatous hyperplasia of the gastric epithelium, ulcers of the mucosa and hyperplastic development of the glands. The liquid products formed by combustion of petroleum when applied to the skin of rabbits produce malignant tumors. The danger of soot is pointed out.

338 Sulfur Dioxide Injuries. Symanski. Arbeiterschutz. p. 465 (1941).

Sulfur dioxide injuries (frequently occurring in founding magnesium alloys) although generally of temporary nature, may lead to indispositions lasting a week or longer.

- 539 Gas Hazards of Sulfur Dioxide. R. Freitag. *Z.Eis.u.Kaelte.Ind.*, 35, 3-4 (1942).
A review on the possible sulfur dioxide content of the air in industries handling sulfur dioxide, the dangers for man, precautions for preventing the hazards, and treatment of sulfur dioxide poisoning.
- 540 A Solvent Vapor, Carbon Disulfide -- Absorption, Elimination, Metabolism and Mode of Action. R.W. McKee, C. Kiper, J.H. Fountain, A.M. Riskin and Philip Drinker. *J. A. M. A.*, 122, 217-222 (May 22, 1943).
Laboratory animal, human and in vivo tissue experiments on the absorption, elimination, metabolism, and mode of action of carbon disulfide show the following results: (1) Saturation of the body with the relatively insoluble solvent vapor of carbon disulfide is quite rapid, requiring from 30 to 60 minutes. The necessary time interval depends largely on the exposure concentration and is longer with higher concentrations. (2) The major part of the elimination of retained free carbon disulfide takes place in the first 30 minutes; complete desaturation, however, requires 3 to 8 hours. The rate of desaturation, like the rate of saturation, depends to a large degree on the exposure concentration, a longer time being required with a higher concentration. (3) No matter how high the exposure concentration, a saturation point is reached beyond which there is no further absorption of carbon disulfide except as it is metabolized and excreted in the urine. (4) Of the retained vapor, about 8 to 13 per cent is excreted in the expired air, about 0.5 per cent in the urine and none in the feces. (5) The remaining 85 to 90 per cent of carbon disulfide is probably accounted for as metabolites (inorganic sulfates and organic sulfur compounds) excreted in the urine. (6) No free or metabolized carbon disulfide is found in the feces. (7) In vitro manometric experiments show that carbon disulfide in relatively large quantities inhibits slightly the succinic oxidase enzyme system, important in intermediate carbohydrate oxidation and normal nerve tissue metabolism. The pyruvic acid oxidase, pyruvic acid decarboxylase and lactic acid dehydrogenase systems which involve vitamin B₁ were not inhibited by carbon disulfide.
- 541 Methyl Bromide Poisoning. E. Schifferli. *Rev. med. Suisse Romande.* 62, 244-250 (1942).
Methyl bromide appears to act directly on the skin, central nervous system and vasomotor system. It enters the human body through the respiratory passages and skin. No remission period is observed; there is a continuity in the symptoms. Generally, several hours elapse between the time of exposure and the appearance of severe symptoms.
- 542 Protective Action of Sulfanilamide Against Liver Cirrhosis from Chronic Poisoning with Carbon Tetrachloride. J.C. Forbes, B.E. Leach and G. Zur Williams. *Proc. Soc. Exptl. Biol. Med.*, 51, 47-48 (1942).
Administration of sulfanilamide to rats retards development of liver cirrhosis from chronic carbon tetrachloride poisoning. Thiamine, riboflavin, pyridoxine, calcium pantothenate, inositol, alanine, glycine, tyrosine, methionine and nicotinic, p-aminobenzoic and ascorbic acids have no protective action in acute poisoning by carbon tetrachloride. p-aminobenzoic acid did not decrease the protective action of sulfanilamide in acute carbon tetrachloride poisoning.
- 543 Effects of Exposure to Toluene Used as Component of Paints. L. Greenburg and others. *Industrial Hygiene (N.Y.)* 22, 169-170 (April, 1943).
Based on this study of 106 painters exposed to the inhalation of toluene of between 100 and 1,100 parts per million for periods of time ranging from two weeks to more than five years, it is concluded that: (1) Industrial exposure of human beings to toluene resulted in enlargement of the liver, macrocytosis, moderately decreased levels of erythrocyte counts and absolute lymphocytosis; (2) Such exposure did not result in leukopenia; (3) Early chronic toluene intoxication in man is best evidenced by hepatomegaly and macrocytosis.

- 545 Cadmium Poisoning. Masao Kamakura. Japan J. of Med. Sci., 7, Social Med. Hyg., 1, 256-7 (1940).
An erroneous intravenous injection of 10 cubic centimeters of two per cent cadmium chloride solution in place of calcium bromide caused the death of an 18 year old boy 40 minutes after the solution was administered. Animal experiments (rabbit) with the same solution showed similar results but the effects were less severe.
- 546 Plumbism Resulting from Oxyacetylene Cutting of Painted Structural Steel. I. R. Babershaw and others. J. Ind. Hyg. & Tox., 25, 189-191 (May, 1943).
The lead hazard from paint on structural steel when being cut with oxyacetylene torches was extremely common during and after World War I and is once more assuming proportions which bring it to attention. The authors conducted a study of a group of 14 men engaged in salvaging an old elevated railway structure. Lead was present in the paint and filler, and scrapings contained 7% lead. Four lead determinations in the breathing zone with natural ventilation better than average, gave 1.8 to 24.0 mg. lead per 10 cu. m. air, all above the maximum allowable concentration. Although mechanical respirators approved for use in toxic fumes were worn by all except two workers, who wore canister-type filters with a charcoal soda-lime filter, and the men were exposed to the fumes only during adjustment of the filters and other necessary times, the urinary lead concentration ranged above the normal of 0.00 to 0.08 mg. lead per l. in nearly all workers. Practically all were ill at one time or another with some symptoms of lead poisoning, and two case histories that are presented give indications of poisoning. The evidence is overwhelming that the process is a potential source of plumbism and that neither the use of respirators nor natural ventilation provides complete protection. Suitable respirators should be provided, but medical examinations should also be given periodically including blood and urine studies. Workers who develop signs or symptoms of plumbism should be rotated to less hazardous jobs.
- 546 Vitamin C and Lead Poisoning. Linka. Zahnarztl. Rundschau., 49, 1900-2 (1940).
The hypothesis that the detoxicating effect of ascorbic acid is due to the combination of lead and the vitamin is offered. It is said that lead poisoning is not related to an avitaminosis.
- 547 Effect of Sodium Citrate Administration on Excretion of Lead in Urine and Feces. T.V. Letonoff and S.S. Kety. J. Pharmacol., 77, 151-3 (1943).
In eight of nine patients with histories of long lead exposures, sodium citrate given in daily oral doses of 15-20 grams caused appreciable increases in urinary and fecal lead excretion.
- 548 Health Hazards in Welding. G. Kiper. Ind. Med., 12, 150-152 (March, 1943).
Dr. Kiper describes briefly the procedures employed in industrial welding and relates these procedures to health hazards. A classification of these hazards in arc welding is: (1) Gases, mainly nitrogen oxides; (2) Metal fumes, vapors and smokes. The most important of these are the metal fumes of iron oxide. Common symptoms are constant gastro-intestinal troubles, a constant polycythemia vera, and metal fume fever. (3) Artificial ionization, causing subjective symptoms as well as physiological changes in metabolism, blood pressure, pulse and respiration. (4) Radiation, which may cause subjective eye troubles. Health hazards in oxyacetylene welding include all these plus carbon monoxide poisoning, acetylene asphyxia and poisoning from impurities in the acetylene. Besides these, there is the constant danger of burns and eye injuries. A list of preventive measures is given which includes adequate ventilation, protective clothing, careful preemployment and periodic physical examinations, and education and instruction of the workers.

- 499 The Magnesium (Grinding of Castings and Other Articles) Order, 1943, Dated February 11, 1943. Made by the Minister of Labor and National Service Under Regulation 29 of the Defence (General) Regulations, 1939. (Statutory Rules and Orders, No. 268. The order applies to factories where persons are employed in the grinding or polishing of castings or other articles consisting wholly or mainly of magnesium, and "magnesium" is meant to include an alloy containing more than 20 per cent of magnesium. The occupier is required to keep all plants and apparatus in good condition. Precautions are prescribed to prevent the causing of sparks. There must be adequate provision for dust removal and safe disposal, and there must be automatic arrangements to ensure that the dust removal plant is operating if mechanical power is used for grinding or polishing, and this plant must have been in operation for the preceding five minutes before the process is begun. Dust, sludge and scale deposited in any scrubber used for dust collection must be removed at least weekly, and no tool containing iron or ferrous material may be used for that purpose. Precautions for the disposal of material from a scrubber are prescribed. Smooth, fire-resisting protective clothing must be provided for the workers. There must be no smoking, open lights or fires within 20 feet of any process or of any scrubber or other container for magnesium dust, or in any room where scrubblings are lodged. Obligation is laid on the employees to refrain from any practices prohibited above, and to report any defects.
- 500 Safe Limits on Mercury and Chromates in Air Work Places. P.A. Neal and F.H. Goldman. Indust. Stand., 14, 79-80 (March, 1943). This brief article describes the health hazards of mercury, chromic acid and chromates. The need for safe standards is emphasized primarily for mercury where war requirements have increased production of this commodity to the point that many low grade sources in this country are now being utilized. Recommended standards are 1 mg. per 10 cu. m. for mercury and 1 mg. per 10 cu. m. of chromic acid anhydride. The latter standard applies to hexavalent chromium compounds only.
- 551 Silicosis: General Considerations and Survey in Coeur D'Alene Mining District of Idaho. P.M. Ellis. Northwest Med., 41, 406 (December, 1942). The authors tabulate the results of 7,542 physical examinations out of 10,000 mine workers and new employees in the Coeur D'Alene district, from 1935 to 1942. Of the total number 1,299 had not been exposed to silica dust but the remaining 6,243 had been exposed for 1 to 45 years. Of these workers 31% exposed for (an average) three and a half years had no silicosis on roentgen and clinical study, the roentgenograms of 32 per cent exposed for six and twenty-nine hundredths years showed excessive linear exaggerations (called presilicosis by many), 2.32 per cent exposed for more than eight and up to more than fifteen years had silicosis and tuberculosis, 0.24 per cent exposed for three years had tuberculosis without silicosis and the remaining 35 per cent exposed for eleven to nineteen and a half years had various grades of silicosis. The authors feel that disability from simple uncomplicated silicosis is not as severe as might be assumed from the roentgenograms alone. For determining disability, exercise tests such as used in life insurance examinations and those now used in examining draftees for the Army are sufficient for the average person when a careful history, physical examination and adequate roentgenograms are had. Superimposed infection is the greatest factor in increasing dyspnea, cough and disability to work. Tuberculosis is the most important; it tends to increase the susceptibility to silicosis. Diseases incident to advancing age must be considered. In many persons the treatment of silicosis is entirely that of prevention, and this is an engineering problem. Above all, the contact of the silicotic patient with tuberculosis must be avoided. A man who has worked long enough under present conditions for silicosis to develop is an experienced and valuable employee, especially in these times, and he may be able to produce much more, if there is no superimposed infection, than an individual in perfect health with no experience. If this man's exposure to fine quartz

particles is low enough to be safe, he, in the light of present knowledge, may work productively with little further danger.

- 552 Dust Investigations in the Ceramic Industry. Part IV. Pan-
ter Ground Earthenware White Tile Dust. K.L. Goodall. Trans. Brit. Ceramic Soc., 42, 1-10 (1943).

Earthenware white tiles are made from a finely ground clay of which the typical composition is 40% calcined flint, 30% Devon and Dorset clays, 20% china clay and 10% Cornish stone. The dust is prepared for use by grinding 10 to 12% of moisture. The filter-press cakes of this composition are ground either in a pan mill or in a disintegrator to give the fine dust required for the tile presses. The work described in this paper was done to ascertain whether dust ground by either of these methods was safer to use than that ground by the other. If one dust were distinctly coarser than the other, then that would probably be the safer to use. Microscopical determinations were made of the size distributions of the two kinds of dust in samples obtained from the majority of firms in the industry. Samples of the air-borne dust associated with various processes where one or other of the dusts was used for tile-pressing were taken by means of the thermal precipitator, and the size distributions of the dusts determined. From these lines of investigation it appears that the size distributions of the dusts ground by the two methods are virtually identical, that the distributions of the dusts in the air of shops where the two kinds of dust are used are also the same, and that there is no evidence that the total dustiness of the air in the press shops is influenced by the method by which the dust is prepared.

- 553 The Chronic Toxicity of Aerosol-OT. A.E. Benaglia and others. J. Ind. Hyg. & Tox., 25, 175-180 (May, 1943).

Aerosol-OT is the trade name of a wetting and penetrating agent consisting of the dioctyl ester of sodium sulfosuccinate. It has extensive applications in the textile industry, paint and ink manufacture, ore dressing, cleaning and photography, and is used in cleaning operations in other industries. It is usually employed in concentrations of 0.01 to 0.1%. It is being considered as a possible ingredient in dentifrices, pharmaceuticals and other products which may involve the absorption of small amounts by human beings. Therefore, experiments on toxicity were desirable. In extensive experiments with rats, monkeys and dogs, the authors found the hematological picture normal, no pathological findings, and no effect on survival, all indicating a low order of toxicity for Aerosol-OT. Some degree of gastro-intestinal irritation was observed. It seems unlikely, however, that reactions of that sort in human beings should follow its use in the food industry when it is considered that it is used in concentrations of the order of 0.01-0.1%. Lack of toxicity for man is evidenced by the fact that careful periodic physical examinations have failed to reveal any toxic symptoms in workmen who have handled the material daily over periods of years.

- 554 An Outbreak of Halowax Acne ("Cable Rash") Among Electricians. L. Schwartz. J.A.M.A., 122, 158-161 (May 15, 1943).

In spite of their known effect on the skin, the halowaxes are used in insulation of wires and cables. Four West Coast Shipbreaks of "cable rash" among electricians stripping cables in wax. On investigation, it was learned that in only one of the genuine chloro-wax acne. The cable used at that plant had a halowax was easily loosened from the asbestos and would easily rub off on the skin and clothing of the workers. In the other three plants the cable coating was more compact and the halowax was not easily loosened. The diagnosis was decided by exposure history and appearance and location of the lesions, which differ somewhat in location, number of comedones, content of cysts, dryness

of the skin and persistency of the lesions. Halowax acne closely resembles coal tar pitch acne, and they can be distinguished only by case history. The lesions are found where clothing that contains halowax touches the skin, and wives and families of workers are thus exposed. Precautionary measures recommended include use of hood respirators, wearing of clean coveralls and long undersclothes cleaned daily, precautionary liver tests, and the application of a protective cream containing shellac, isopropyl alcohol, talcum powder and other ingredients.

- 555 Hazards in Industrial Use of Chlorinated Naphthalene and Diphenyl. E.C. Riley. N. Y. State Ind. Bull., 80-81 (February, 1943).

A recent increase in cases of occupational dermatitis, chloracne and acute or subacute yellow atrophy of the liver, has been attributed to chlorinated naphthalene and diphenyl compounds (trade names are Halowax and Aroclor). Wherever these compounds are handled without adequate control measures, industrial disease has resulted. Poisoning may result from inhalation of vapors or fumes, from prolonged skin contact with vapor, fume, liquid or solid phase, or from ingestion of any of the forms, and in general, the more chlorine atoms in the compound, the greater the toxicity. Warning signs of toxicity are (1) appearance of a skin rash after prolonged exposure to these materials, and (2) systemic effects, the most serious of which is jaundice. The relation between these two signs is unknown, although persons with rash usually do not develop systemic poisoning. The former symptom leads to small lesions in the exposed area which may suppurate, the latter leads to toxic destruction of liver substance. The liver is the organ most affected in systemic poisoning, though liver damage frequently is observed after months of exposure when the patient is seriously ill with jaundice. Various preventive and hygienic measures are recommended: proper ventilation and cleaning of impregnating machines used; constant medical examination (contraindications to working with these materials are liver disease, jaundice, anti-syphilitic treatment, pregnancy); frequent and supervised change of clothing before coming to work; use of creams; and informing the workers in regard to proper handling of the compounds, and possible toxic effects.

- 556 Metol Poisoning. A. Boström. Nord. Tid. Fot., 25, 135-6 (1941).

Pure metol (monomethyl-p-aminophenol sulfate) is relatively harmless. However, certain impurities, especially the dimethyl derivative, are poisonous and cause skin eruptions. A salve consisting of 10 g. ichthyol, 40 g. lanolin, 30 g. petrolatum and 25 g. finely ground boric acid is recommended for the treatment of metol eczema.

- 557 A Note on p-Nitroaniline Poisoning. R. Lobo-Mendonca. Indian Med. Gaz., 77, 673-676 (1942).

Cases of industrial poisoning caused by its use as dye in the textile industry are described. The dye is most commonly absorbed by the skin, causing paralysis of the central nervous system, and marked cyanosis, sometimes death. A spectroscopic examination of the blood reveals the presence of methemoglobin. In several cases the hemoglobin is excreted and hematoporphyrin is found in the urine. p-Nitroaniline as well as p-aminophenol were found in the residue of ether-extracted urine.

- 558 Paraphenylenediamine. M.A. Feil. Presse med., 49, 819-20 (1940).

Paraphenylenediamine will cause toxic symptoms, especially in people with sensitive skins. Progressive sensitization may occur after years of symptom free exposure to the compound. Desensitization is recommended, principally when the chemical is used as hair dye. Respiratory asthma is a common effect. Paraphenylenediamine in fur dyes may cause toxic effects.

- 559 Observations on the Fate of Pentachlorophenol in the Animal Organism. W. Machle, W. Leichmann and G. Thomas. *J. Ind. Hyg. & Tox.*, 25, 192-194 (May, 1943).
In connection with the previous work of the authors on the toxicity of pentachlorophenol, information on two additional points was necessary in order to pave the way for studies on human beings. The first concerned the largest amount of pentachlorophenol that could be ingested daily without causing retention in the blood. It was found that 1 mg. per kg. body weight caused only doubtful retention. The second question was the relationship between concentrations in the blood and urine following ingestion. During the 8 hours following the ingestion of 50, 100 and 200 mg. respectively, the ratio of urinary concentration to blood concentration varied from 23 to 34. In 24 hours there were very considerable decreases in both. These results confirm earlier observations and suggest that urinary determinations may offer a sensitive means of estimating the extent of human absorption and therefore of exposure.
- 560 Acute and Chronic Effects of Pentachlorophenol and Sodium Pentachlorophenate upon Experimental Animals. W. Deichmann and others. *J. Pharmacol.*, 76, 104-117 (1942).
Pentachlorophenol (I) and sodium pentachlorophenate (II), when absorbed in sufficient quantity into the tissues of dogs, rabbits, rats and guinea pigs, produce an acute toxic state characterized by accelerated respiration, moderately elevated blood pressure, hyperpyrexia, hyperglucemia, glucosuria and hyperperistalsis. Fatal cases end in asphyxial convulsions and cardiac and muscular collapse. Rigor mortis is immediate and profound. Irritation of the skin and marked local damage, followed by complete recovery, is the usual result of cutaneous application of I. II can be absorbed through the skin into the blood. II is rapidly absorbed from the stomach. Feeding small amounts mixed with the diet causes no important tissue damage. Repeated sublethal doses do not affect the blood picture. In rabbits approximately 70% of ingested II is excreted in the urine, mostly in the first 24 hours, about 9% decomposed in the body and the remainder is found in the tissues and feces. After intraperitoneal injection in rats excretion is slow. I is not conjugated with sulfuric acid or glucuronic acid. Soap is more effective than alcohol for removing I or II from the skin.
- 561 Toxicity of Thiourea - Adult Life Span Animal Feeding Experiments with Thiourea (Thiocarbamide). Albert Hartzell. *Contrib. Boyce Thompson Inst.*, 12, 471-80 (1942).
Autopsies of thiourea fed mice and rats revealed no pathological change that could be attributed to that compound. Thiourea is used to prevent the browning of cut surfaces of vegetables and fruits.
- 562 The Poisons in Chemical Industry. V. Andriska. *Kem. Lapja.* 2, 10 (2-3), 11 (1-4) (1941).
The industrial poisons are reviewed with respect to mode of entry into the organism, action, treatment and prophylaxis.
- 563 Chemical Fumes and Allergy. *Queries and Minor Notes.* *J.A.M.A.*, 122, 144 (May 8, 1943).
A cooker of varnishes suffers from asthma, which appears when preparing a varnish containing phthalic and maleic acids. The question is how the attacks may be avoided. The fumes irritate all persons, but allergy greatly increases the extent of irritation. Allergy tests are suggested. If it is not possible to remove the fumes, a respirator should be worn, and an ointment in the nostrils. If these measures fail, change of occupation is the only alternative.

4. Memorandum on the Prevention of Industrial Dermatitis; With Special Reference to the Use of Barrier Substances. Ministry of Labor and National Service, Factory Department. Form 530, (December, 1942).
The protection of the exposed skin by a barrier substance is important where there is a dermatitis hazard. Requirements of a barrier substance are: that it should be non-irritant, its pH value should be about 5.5 to 6.5, it should be insoluble in the substances to which there is exposure, it should be easily applied, non-slippery, and easily removed by ordinary washing. Even when gloves are worn barrier substances should be applied as an added protection against strong acids or caustic alkalis. In cases of exposure to aniline or TNT or other substances where there is risk of absorption of poison, care must be taken in the choice of barrier substances as fat applied to the skin may increase the risk. Thorough inspection of the skin should be carried out to ensure full use of protective measures and to detect early signs of irritation. Cleanliness, and the provision of suitable washing facilities, are essential.
- 565 Industrial Dermatitis: Diagnosis and Treatment. A.D.K. Peters. The Practitioner, 149, 340-348 (December, 1942).
Industry is concerned with contact dermatitis. Its diagnosis is simple, but the problem of isolating the responsible irritant may be complex -- it involves a survey of the worker's entire environment, 24 hours a day and 7 days a week. The factor of idiosyncrasy is important. Sensitiveness may vary with age and with pigmentation and thickness of the skin. The effects upon the skin of caustic substances, weak alkalis, fat solvents, and some other chemicals are described. Inadequate cleansing and the use of certain cleansers are possible causes of dermatitis. Differential diagnosis and preventive measures are discussed. The use of barrier substances is advised and methods for their use are discussed briefly. Susceptible workers should be placed on a probationary period, with light contact in order that they may be removed before they incur severe dermatitis. Treatment comprises removal of the irritant from the person, prevention of fresh contact, and dehydration and protection of the inflamed skin.
- 566 Chemicals in Fabrics as Potential Skin Irritants. H.E. Cox. Proc. Roy. Soc. Med., 35, 27-33 (1941).
Unoxidized paraphenylenediamine, chromium compounds, vegetable tannins, logwood, fustic, and gallotannic acid have been found to be the cause of skin irritation from dyed fabrics. Woolens contain sulfite, dyes and mordants which may produce dermatitis. Wetting agents, delustering, anticreasing, and waterproofing compounds are known to be occasional irritants in textiles. Some of these compounds pass through the skin, causing hemolysis. Some of the anticreasing compounds are synthetic resins which may contain free formaldehyde. Beta hydroxynaphthoic is used in rayon and traces of the compound have caused dermatitis. Phenols, amines, and quinones are used to prevent the deterioration of latex rubber which is hastened by perspiration. The decomposition retardants are skin irritants and sensitizers.
- 567 Skin Hazards in the Manufacture of Glass Wool and Thread. L. Schwartz and I. Kotvinick. Ind. Med., 12, 142-144 (March, 1943).
Protective and preventive measures against skin sensitization depend upon the type of job at which the worker is employed. In general, these measures include: (1) Clean work clothes daily; (2) Shower baths after work; (3) Gloves, heavy clothes, and impervious sleeves and aprons; (4) Petroleum jelly on the nasal septum; (5) An "invisible glove" type of cream to all exposed parts.

- 568 Infectious Hepatitis and Infectious Keratoconjunctivitis Provisionally Added to Manual "Control of Communicable Diseases." U.S. Pub. Health Repts., 58, 405-408 (March 5, 1943).
Keratoconjunctivitis has recently been included in the manual "Control of Communicable Diseases," sponsored jointly by the Public Health Service and the American Public Health Association. A description of the disease is given, including methods of control.
- 569 A Skin Lesion Resembling That Caused by Mustard Gas, Found in a Varnish Factory. J. Winterscheid. Arch.f.Gewerbepath.u.Gewerbehyg., 11, 249-255 (December 31, 1941). (German).
A slow-healing skin lesion blistered at the edges is described in a worker when an unprotected part of the arm came in contact with a varnish solvent, Polysolvan O, contaminated with various varnish and solvent residues. Polysolvan O is a water-clear colorless mixture of esters of aliphatic alcohols, immiscible with water and of low volatility (it contains no ethanol), boiling point 150-200°C, flash point 55°C. Patch testing acquitted Polysolvan O of skin irritation when pure. The possible varnish residues Vinoflex MP 400 (a synthetic unsaponifiable mixed Vinyl chloride polymerizate), Vinnapas BP (a polyvinyl acetate), Kollodiumwolle A3 (a low viscous alcoholic nitrocellulose), and the solvent residues xylol, solvent benzol II, toluol, ethyl acetate, spirit and butyl alcohol were then tested on three individuals. The causal factor of the skin irritation was found to be the combined action of Polysolvan O and Vinnapas BP. A protective fatty ointment "Quimbo" is recommended as a preventive measure.
- 570 The Effect of Turpentine Oil on Normal and Hypersensitive Skins. I. Rokstad and P. Bonnevie. Acta Dermato-Venercol., 22, 401-451 (1941).
Components of turpentine were tested for their eczematogenous and toxic reactions. Detailed criteria for toxic effect and eczematogenous effect are given. A new skin-test method, the adhesion chamber method, is described. In the low-boiling impurities of turpentine a certain parallelism was found between toxic and eczematogenous effect. This is not true for the terpenes themselves, which showed no distinct differences in a toxicity sense, but a marked difference in an eczematogenous sense. The strongest eczematogenous effect was found with delta 3-carene and limonene. The impurities have the smallest effect in both respects.
- 571 The Industrial Worker -- His Eyes. A. Ebling. Sight Saving Rev., 1943; Ind. Med., 12, 178-180 (March, 1943).
The need for better knowledge and better application of this knowledge about the eyes is emphasized. Many firms, provide pre-employment eye examinations followed by periodic tests. Management has also afforded protection against injury by providing goggles, shields, face masks, helmets and hoods. However, certain disease hazards have been ignored by management and worker alike. Among these are poor lighting, unhealthy working conditions, and unsanitary conditions and practices in work places. Some suggestions for protecting the eyes from disease or difficulties are: Do not rub the eyes with a dirty towel, handkerchief, sleeve, or hand; get expert first aid for eyes; use mechanical protection if necessary; use your prescribed glasses; go to the eye clinic or doctor as soon as disturbances are noted; get plenty of sleep, rest, relaxation and good food.
- 572 The Problem of Simulation of Industrial Eye Injuries. J.M. Vila Ortiz. Anales Argentinas de Ort., 2, 159 (October, November, December, 1941).
The author divides the various types of malingering into groups and discusses different phases of each group. He gives the percentages of malingerers among industrial eye accidents, as reported by different writers. In the detection of simulated blindness the diploscope of Tarducci was found most useful. (3 figures.)

- 573 First Aid for Eye Injuries. A.E. Town. Sight Saving Rev., 12, 163 (Sept., 1942). The most frequent injuries to which eyes are subjected are from foreign bodies. Corneal foreign bodies should be cared for by the surgeon. Penetrating wounds of the eyeball are always serious and call for immediate aid by an eye surgeon. Because of the rapid lid-reflex most thermal burns affect only the skin of the lids. In the third-degree burns of gasoline explosions in automobile or aeroplane accidents, the explosion is so rapid that there is no time for lid closure; hence the conjunctiva and cornea are involved and lid margin may be lost, producing severe deformities. The gases of chemical warfare, if used in this war, will be disseminated by aeroplane spray and the civilian population will suffer if unguarded by gas masks. Lewisite may cause blindness. It penetrates deeply. Oils and ointments retain lewisite, and therefore should not be used. Immediate and repeated irrigations of two per cent solution of sodium bicarbonate are advised. Tear-gas symptoms are severe but the irritation is only temporary.
- 574 Plant Lighting. Anonymous. Nat. Safety News. 47, 111-112, 130 (March, 1943). This article is an excellent review of the illumination requirements for industrial plants. The need for better lighting in war industries is stressed. A convenient chart guide for estimating the number of lamps required for 50 foot candle installations accompanies the article. Fluorescent lighting is discussed briefly.
- 575 The Prevention of Ear Disability in Industry. D.A. McCoy. J.A.M.A., 121, 1330-1331 (April 24, 1943). A plastic ear mold has been developed to protect the ear from intense noises in places such as airplane assembly lines and shipyards. Each mold is fitted to the particular ear, and the molds are relatively indestructible, efficient in diminishing intense and high frequency noises while permitting conversation, prevent the entrance of foreign matter, and are light, transparent and easily cleaned. Thus the hazards of loud noises and of slag burns and of other damage by foreign matter are prevented.
- 576 Air-Borne Infection. O.H. Robertson. Science. 97, 495-502 (June 4, 1943). The paper reports the recent growth of knowledge of the role played by air in the transmission of respiratory disease. During the present war respiratory disease, though mild, has been prevalent and accounts for half the total of all cases admitted to hospital. The hemolytic streptococcus, commonly found in acute infections of the respiratory tract, presents a menace should the present type of respiratory disease become more severe or should an epidemic of influenza occur. As evidence for aerial transmission of infection, a number of clinical observations are reported, which give support to the conclusion that, in closed spaces, this mode of transmission does take place. Experimental studies, a number of which are described have yielded more conclusive evidence. Measures which are being advocated for the control of air-borne infections fall into two categories -- those designed to prevent dispersal of infectious material into the air, and those employed or proposed to reduce the infectivity of contaminated atmospheres by killing or removing the disease-producing agents. Preventive measures of the first type are: Oiling of floors and blankets; isolation of infected patients; adequate masking; and ventilation. The value of ultraviolet radiation in the spread of air-borne infection is not fully established, but it has been effective under certain conditions and in certain types of disease. Disinfection by chemical means is a method of air-sterilization that has been recently introduced. Search was made for a substance that is non-toxic, non-irritating to the respiratory tract, odorless, tasteless, and yet possessing a marked and rapid killing action on the bacteria in the air. Among the compounds tested, propylene glycol most nearly fulfilled the requirements. The

results of the action of propylene glycol in various concentrations are given and a tentative explanation is made of the mechanism of its bactericidal effect on air-suspended bacteria.

- 577 The Effect of Propylene Glycol Vapor on the Incidence of Respiratory Infections in a Convalescent Home for Children. Preliminary Observations. T.W. Harris and J. Stokes. Am. J. Med. Sci., 204, 430-3 (1942).

A great reduction was obtained in the incidence of respiratory infection during a period when propylene glycol was vaporized in a ward.

- 578 Bacterial Observations on the Air of Occupied Premises. I. Air Disinfection with Hypochlorites. S.W. Challinor. J. of Hyg., 45, 15-54 (January, 1943).

Experiments were carried out making bacterial counts of samples of the air under various conditions from a poorly ventilated room, sized 1700 cubic feet and containing 14 to 17 men. Hypochlorite was the germicide used and was atomized by one of two methods, either a Dynalysor or a simple hand-spray flit gun. Although the Dynalysor was the more effective method, even the large drops produced by the hand-spray caused approximately a 33% reduction in the bacteria count. Most of the experiments were carried out with a hand-spray because of its availability to the public. The concentration of hypochlorite used was extremely small, 0.38 cc. hypochlorite per million cc. air or about 18 cc. totally. One spraying of this concentration by a hand-spray reduced the total bacterial count of the air in the order of 33% or more. These results are probably low, for never more than 2% of the total count were pathogenic bacterial, and it is known that many saprophytic bacteria are relatively resistant to disinfection. The pathogenic bacteria are also moist, and therefore probably more susceptible to disinfection than the dried bacteria of the air. Reduced bacteria counts lasted only 15-20 minutes, therefore indicating the necessity of repeated sprayings. Hypochlorite containing 1% sodium hypochlorite was more effective than bleaching powder. Relative humidity had to be 60%-70% before maximum results were obtained. Tobacco smoke reduced the effectiveness of the hypochlorite. Of interest is the fact that the occupants could always smell the hypochlorite for a few minutes, but that very few irritant or corrosive effects were found. The occupants said that the hypochlorite "freshened" the room.

- 579 Studies on Air-Borne Virus Infections. I. Experimental Technique and Preliminary Observations on Influenza and Infectious Ectromelia. D.G. Edward, W.J. Elford and P.P. Laidlaw. J. of Hyg., 43, 1-10 (January, 1943).

A method is described for the experimental investigation of aerosol systems formed by the atomization of suspensions of viruses into the atmosphere. This opens an experimental approach to such problems as the use of ultraviolet light and aerosols of chemical antiseptics as counter measures against air-borne virus infections. Mice, placed in an atmosphere in which the respective virus has been atomized, contract the diseases of influenza and infectious ectromelia in a manner closely analogous to naturally occurring air-borne infections. Two methods of experimental infections, intranasal instillation under anesthesia and normal inhalation, are compared and contrasted. It is deduced that as little as 1 per cent of the virus may reach the lungs of mice breathing normally in the atmosphere containing dispersed nuclei of influenza virus. Evidence was also obtained indicating the superior persistence of infective nuclei carrying influenza virus in dry, as compared with humid, atmospheres.

- 580 Studies on Air-Borne Virus Infections. II. The Killing of Virus Aerosols by Ultraviolet Radiation. D.G. Edward, D. Lush and R.B. Bourdillon. J. of Hyg., 43, 11-15 (January, 1943).

The technical method used is that of the aerosol systems described in Part I of this article, pp. 1-10 of the same journal. The experiments show that rapid and

effective sterilization of atmospheres containing particles of influenza and vaccinia virus, and probably also of herpes simplex virus, can be obtained by ultraviolet radiation of wave-length 2537 Å. At least 99% of an aerosol of influenza virus is killed by exposure for six seconds at a distance of 2 cm from either a Hanovia or a G.E.C. "Sterilamp." At the same distance, the "Sterilamp" produces more than a 99% kill of vaccinia virus with an exposure of one second and about a 90% kill in 0.5 sec. These results indicate that "germicidal" lamps are likely to be useful in reducing the infectivity of air contaminated with particles from persons suffering from virus infections of the respiratory tract.

- 581 The Chemical and Physical Investigation of Germicidal Aerosols. II. The Aerosol Centrifuge. S.R. Finn and E.O. Powell. J. Hyg., 42, 354-364 (1942).
The centrifuge consists of two coaxial cylinders between which a gas, carrying suspended particles, is passed longitudinally. The outer cylinder rotates, or both do so together, and the particles then tend to collect on the outer wall of the annular space. The particles that enter the centrifugal field very close to the inner cylinder will have the best chance of escaping. When the cylinders rotate together, there will be a critical particle size or "cut off" where all particles above this size will be collected. When only the outer tube rotates there is no such limit. The relations between the behavior of the centrifuge and its dimensions, speed, and airflow were experimentally tested and mathematical formulas derived which give an adequate basis for design.
- 582 Urban Air Pollution and Respiratory Diseases. C.A. Mills. Am. J. Hyg., 37, 131-141 (March, 1943).
There exists a highly significant relationship between atmospheric pollution (sootfall) and respiratory disease death rates in the various districts of Cincinnati and Pittsburgh. This hazard involves particularly the men living and working in the badly polluted industrialized districts of the two cities. Even the females of these districts show much more respiratory disease than is found in the hilltop suburbs, but the male rates rise two to three times more than the female. Little difference between male and female rates exists in the suburban areas of these two cities or among rural residents of Ohio. Exhaust steam from power sources adds greatly to the winter smoke problem by remaining as a fog to hold the flue products suspended in the air th people must breathe. Remedial steps should include: (a) use of low-volatile coal or proper equipment to burn high-volatile varieties smokelessly; (b) effective trapping of fly-ash in chimney or stack; (c) preliminary washing of high-sulphur coals; and (d) use by the railroads of Diesel or electric power within metropolitan limits. - Author's summary.
- 583 Chest Disease in Industry. A.J. Amor. The Practitioner. 149, 326-339 (December, 1942).
Chemical poisons are tabulated, according to their sites of action on the respiratory tract and the types of lesions produced are also shown. There follow discussions of etiology, pathology, and clinical manifestations, and, finally, notes on works practice. The original paper should be read by those interested.
- 584 Sporotrichosis on the Witwatersrand. C.J. duToit. Proc. Transvaal Mine Medical Officers' Assoc., 22, (June, 1943).
The disease described is a rare fungus infection widely and irregularly distributed among the mines of the Transvaal. The habitat of the fungus is on treated or untreated timber, in mine water and in mud at wide range of temperature and pH. Symptoms are described and the development of the disease is traced. Treatment with potassium iodide is effective and brings relief within a period of a week. Preventive measures are suggested. It is an industrial disease and is compensable.

Gastric Acidity in Pulmonary Tuberculosis. A.L. Kruger. Am. J. of Digestive Diseases, 10, 111-114 (1943).

The incidence of gastric anacidity was found to increase with the severity of the tubercular lesion and with fever in a study of 325 patients with pulmonary tuberculosis. No relationship was found between the degree of acidity and anacidity. The presence of intestinal tuberculosis did not correlate with acidity.

Controlling Absenteeism. U.S. Department of Labor, Division of Labor Standards, Special Bulletin No. 12. (1943). Obtainable from the Supt. of Documents, Washington, D.C. - 10 cents.

For plants experimenting with control devices for absenteeism have based action on careful attention to the following factors and problems: (1) Definition and Records; (2) Responsibility; (3) Industrial Relations; (4) Personnel Management and Supervision; (5) Causes Related to the Job and the Individual: (a) production planning and material shortages; (b) hours; (c) wages; (d) industrial accidents and disease; (e) industrial fatigue; (f) nutrition; (g) indifference or boredom; (h) lack of awareness of relation of job to war effort; (i) personal work patterns; (j) induction into the armed services. (6) Causes Growing out of Community Problems: (a) transportation; (b) housing; (c) wartime difficulties in conducting shopping and personal business; (d) child care; (e) recreation.

147 Sickness Absenteeism Among Industrial Workers, Final Quarter of 1942, with a Note on the Occurrence of Bronchitis and Pneumonia, 1933-1942. W.M. Gafafer. Pub. Health Repts., 58, 677-680 (April 23, 1943).

The increase in bronchitis and pneumonia among industrial workers, noted in a number of Dr. Gafafer's earlier reports, is still in evidence. In this brief report the cases of sickness and non-industrial injuries causing disability lasting more than 7 days are tabulated. The rate of 95.3 absences per 1,000 males in the last quarter of 1942 is 16% higher than the rate for the corresponding quarter of 1941. For bronchitis the increase is 60% and for pneumonia 130%. The difference is most noticeable in iron and steel workers, but is probably largely due to the extraordinary increase in the number of those workers.

148 Absenteeism Control. J.J. Wittmer. Ind. Med., 12, 281-284 (May, 1943).

The author believes that the 4 million skilled man-days lost last year can be reduced by 50%, thus adding the equivalent of a million skilled men to those who are turning out the products of war. Effective action in this direction can be accomplished by following: I. An adequate safety program. II. A comprehensive and intensive health program, and III a labor-management program of supervision of absentees. The health program covers the employee before he goes on the job, while he is on the job, and when he is off the job. The pre-employment examination should fit the man to the job. The medical department is responsible for early diagnoses and treatment of minor illnesses. Preventive measures discussed are: periodic examinations, consideration of the psychology of the employees, responsibility of foremen in discovering changes in the employee's attitude, treatment of upper respiratory infections, provision of rest periods for workers on repetitive routine jobs, proper use of vitamin therapy, study of the question of proper nutrition, and instruction in hygiene, with an effort to urge employees to walk to and from work if they live within a mile of the place of employment. The labor-management program of supervision of absentees is outlined. It involves the thorough checking of absences and the recording of each absence, the setting up of a committee, with representatives from the management and the employees who review the records of absentees and mete out penalties, which in the most cases may amount to discharge.

- 590 The Industrial Physician - And His Relation to Absenteeism. J.J. Wittmer. Ind. Med., 12, 234 (May, 1943).

This article is termed a "supplemental comment" to the foregoing one. The author relates the problem of absenteeism to the industrial physician when he states that he "feels definitely that the industrial doctor plays the largest part of all in controlling this 'loss of time' from work." He presents 25 questions which the doctor must answer in the affirmative if he rates the title of industrial physician and does his bit to keep the worker on the job.

(Editor's Note: For further comment by Dr. Wittmer on absenteeism please see Proceedings of Foundation's Seventh Annual Meeting.)

- 591 Few Women Killed in Occupational Accidents. Metropolitan Life Insurance Co., Statistical Bull., 24, 9-10 (February, 1943).

Women have had a much lower death rate from accidents than men, but an increase may be expected as it becomes necessary to employ more of them in occupations involving serious hazards. However, protective measures have been introduced, and better standards and laws are already in existence.

- 592 Compensated Accidents. New York State Dept. of Labor, Div. of Statistics and Information. N.Y. State Dept. of Labor, Ind. Bull., 22, 163-164 (April, 1943). This report includes two types of compensation cases: (1) accidents due to contact with harmful substances, and (2) occupational disease. The authors believe the two should be grouped together and distinguished only from mechanical accidents, because the two are closely related and sometimes difficult to distinguish. In New York State in 1941 a total compensation of \$1,010,843 was paid for 2,915 cases of the two types. Of this amount \$296,387 was paid for 1,050 accidental contact injuries, leaving \$714,456 for 1,865 cases of occupational diseases. The most common occupational disease is dermatitis venenata, comprising about half the total cases, usually not severe, but one death and four cases of permanent disability resulted from this cause. The cost per case was \$181. Other frequent occupational diseases were silicosis and other dust diseases, lead poisoning, compressed air illness, benzene poisoning, blisters and bursitis. A number of awards were made for infectious or contagious diseases, including tuberculosis, scarlet fever, etc., contracted by nurses in hospitals.

- 593 The Factories (Notification of Diseases) Regulation, 1942, Dated January 26, 1942, Made by the Minister of National Service, Extending the Provisions of Section 66 of the Factories Act, 1937, to Toxic Anemia. Ministry of Labor and National Service, Factory Dept., Form 2011, February, 1942.

By the above mentioned regulation, toxic anemia becomes a notifiable industrial disease in Great Britain. The explanatory leaflet (Form 2011) informs those concerned that the object of this notification is to afford to the factory inspectorate a clue to dangerous conditions over which they can exercise control. Extension of the use in modern industry of X-rays, radio-active substances and various chemical compounds makes it necessary to pay special attention to the health of the workers, and in particular to any effects on the blood and the blood-forming organs. For the purpose of the Regulation the term "toxic anemia" is intended to apply to dishemopoietic anemia. Available information on the chemical substances which may cause this condition is incomplete. It is not intended to limit the term "toxic anemia" to any one type of dyshemopoietic anemia, but to invite the notification of all cases of illness associated with such a disturbance of the blood picture where the patient has been exposed to any of the causal agents mentioned, as well as to others that may be met with so that the case may be fully investigated.

- 593 Annual Report of the Chief Inspector of Factories for the Year 1941. Cmd. 6397. London: H.M. Stationery Office (1942).

The efforts of the Factory Department have been directed to the achievement of maxim production in industry, which can be best accomplished by observing the general provisions of the Factories Act. Favorable working conditions and reasonable hours of work produce the best steady output. To meet a special emergency an extraordinary effort can be made for a short period. It has been hard to convince government departments and private employers of these truths, despite the experience in the last war and the publication of reports of research on hours of work and working conditions. Two other aspects of the work that have been emphasized are those of nutrition and proper personnel management departments in the larger works. An increase in the gross figures of reportable accidents is due partly to the increased number of persons employed. However, the accident rate per 1,000 employees has risen. The increase is proportionately highest for adult females, and is due largely to their employment in dangerous processes. 179 accidents were due to the entanglement of hair in moving machinery. Fencing of machines and wearing of caps are recommended precautions. Greater efforts should be made to prevent accidents, which cause a loss in Great Britain of 50 million man hours a month. The need for good personnel arrangement and welfare supervision is strongly emphasized, with responsibility for the same placed upon management. There is still much to be desired in factory ventilation, especially under black-out conditions. Improvement is reported in lighting since the new Factory Lighting Regulations came in force in 1941. The report on industrial diseases shows the number of lead poisoning to be the lowest since notification became obligatory. There were 41 cases of toxic jaundice due to TNT, one death from chlorinated naphthalene, and one case of phosphorus poisoning. There was a rise in the number of cases of gassing, mainly with carbon monoxide, but slightly fewer nitrous fumes gassing. Of the latter, only one out of 217 cases proved fatal. Dermatitis cases showed an increase, and the importance of the use of protective measures is stressed. Concerning hours of work, it is reported that out of about 10,000 factories employing women and young people over 16, permitted hours were between 55 and 60 in almost half of the cases. A special section of the report deals with canteens. By the end of 1941 there were 6,592 places subject to inspection by the Department which had canteens and 857 which had them in preparation. Their valuable influence upon the health of workers is recognized.

- 594 Twentieth Annual Report of the Safety in Mines Research Board, 1941. Ministry of Fuel and Power, London: H.M. Stationery Office, (1943).

The report gives an abridged account of the research which is continuing under the auspices of the Safety in Mines Research Board. Successful research has been conducted on the problems of dispersion of dust at loading points and suppression of dust during the overcutting of coal, both by the use of water sprays. A filtration method for the reduction of dust passing into return airways from the coal face has been tested and a 98% dust removal achieved. Many studies relating to the use of stone dust in the prevention of coal dust explosions are reported. Two methods for the determination of the proportions of free and combined silica in dusts were tested. Separation by fluoroboric acid was found unsatisfactory, but the other, in which silicates are separated by fusion with potassium pyrosulfate, gave reproducible results and was quicker than the sulfuric acid method. It appeared that the pyrosulfate attacked the quartz slightly and left some silicates unattacked, but the two sources of error tended to compensate. Water containing 5% of a soluble oil, sprayed on disk cutting pyrites failed to prevent ignition of firedamp. Work on flame-proof machinery has progressed. A photographic photometric survey has been made on a length of coal face.

- 595 Minimum Requirements for Safety and Industrial Health in Contract Shipyards. U.S. Navy Dept., U.S. Maritime Commission. Government Printing Office. Paper, 75 pp. (1943).

This code was written as a result of a national conference to promote safety and health in shipyards. The result is a well organized and complete set of rules and regulations which bear on every phase of safety and health. The medical personnel suggested for carrying out the program indicated is barely sufficient, unless there is an adequate supply of clerks and technicians. An X-ray room is suggested for yards with 5,000 men or more. A brief section is devoted to the prevention of industrial disease, and cognizance is taken of the danger of lead poisoning and metal fume fever from welding. In outlining the ventilating standards, the authors suggest that the safety department confer with the construction department so that building procedures may be altered for greater safety without sacrificing the speed or continuity of production. A section is devoted to illumination. The duties and training of the safety director, safety engineer, and safety inspector are dealt with fully. Forms and reports are considered and facsimiles are included in the pamphlet. The emphasis on safety is clearly stated in a regulation as "discovery and correction of unsafe conditions or unsafe work practice Before They Cause Accidents."

- 596 Scientific Solution of Multiple Shift Problems. N. Kleitman. Min. Cong. J., 29, 15-16 (January, 1943).

The present emergency has necessitated employment of two or three or even four shifts to keep plants going 24 hours per day, 7 days per week. Several weeks are required to establish a new 24-hour sleep-work-meals-leisure cycle. Several suggested are included on arranging working hours and scheduling rotation of shifts, to obviate fatigue during work hours.

(Editor's Note: Prof. Kleitman addressed the Seventh Annual Meeting of the Foundation on this subject. See the Proceedings for complete text.)

- 597 The Building and Engineering Construction (Young Persons) Order, 1942, Dated October 28, 1942, Made by the Minister of Labor and National Service Under Regulation 60 of the Defence (General) Regulations, 1939.

The order prescribes the permissible hours of work of young persons (under 18 years old) who are employed in work of building and engineering construction. Young persons who have not reached sixteen years of age may not be employed for more than 48 working hours in any week, and for those between 16 and 18 years of age the maximum hours are 54 per week. They may not be continuously employed for more than 5 hours without an interval of at least half an hour for a meal or rest. Sunday employment is not permissible unless another whole holiday is given in place of the Sunday. Records must be kept of the young persons employed and the hours worked by them.

Methods of Detection and Determination

- 598 The Estimation of Minute Amounts of Tetra in the Atmosphere. F.H. Goldman and J.H. Hushing. J. Ind. Hyg. & Tox., 25, 195-196 (May, 1943).

A method has been described for sampling tetra which is similar to that for TSP using diethylethanol as the collecting medium. The two methods differ only inasmuch as the time interval between sampling and color comparison must be taken into account when making up color comparison standards.

- The Determination of Halogenated Hydrocarbons in the Atmosphere. F.H. Goldman, J. Ind. Hyg. & Tox., 25, 181-184 (May, 1943).
A dynamic method of setting up various concentrations of solvent vapors in air for test purposes is described. Using this method it was found that under ordinary conditions of use both the Willson and the Dudley apparatus are satisfactory. The Willson apparatus gives only slightly lower results, and is excellent with short sampling periods. It cannot be used for unusually long periods or for concentrations of halogenated hydrocarbon over 2,000 parts per million. The amyl acetate method gives quantitative results which are slightly low for the burning of the solvent when the combustion products are absorbed in a fritted glass bubbler. Two fritted glass bubblers in series containing amyl acetate are satisfactory for concentrations of carbon tetrachloride and dichloroethane of 10 to 300 parts per million.
- The Determination of Minute Amounts of Arsenic in Biological Materials. A New Type of Electrolytic Cell for the Production of Arsine. W.A. Rawlinson. Australian J. Exptl. Biol. Med. Sci., 20, 97-101 (1942).
The biological material is ashed with 7 ml. of sulfuric acid and a few drops of nitric acid. The solution, diluted to 50 ml., serves as the catholyte of a cell constructed from a 4 x 17 cm. glass cylinder. The cylinder is closed with a rubber stopper which bears a tube through which contact is made with the mercury cathode, a second tube, sealed at the lower end with cellophane, which contains 4 normal sulfuric acid and the platinum anode and a gas-outlet tube provided with a splash head, space for a roll of filter paper (9 x 3 cm.) impregnated with basic lead acetate and a part for a 4-mm. strip of paper soaked in a 2% solution of mercuric bromide in acetone which absorbs the arsine. The cell is placed in a bath at 25° during the 40-minute period of electrolysis with 2 ampere and 230 v.d.c.
- A Filter Paper Method for Lead Fume Collection. L. Silverman and J.F. Ege, Jr., J. Ind. Hyg. & Tox., 25, 185-188 (May, 1943).
A study of the efficiency of high retention analytical filter papers for collecting air-borne lead fume showed that the efficiency was high (87 per cent) and constant at high flow rates. The flow resistance of the papers is low enough to allow high sampling rates with a simple field apparatus which is light weight and portable.
- Determination of Oxides of Nitrogen by the Phenoldisulfonic Acid Method. R.L. Beatty, L.B. Berger and H.H. Schrenk. U.S. Bur. of Mines, Rept. of Invest., No. 3637, U. S. Bureau of Mines, Washington, D. C. (February, 1943).
The phenoldisulfonic acid method for the determination of oxides of nitrogen in air and in other gaseous mixtures is described. The work of others in this field is reviewed briefly. Additional information gained by the Bureau of Mines in a study of various pertinent details in the procedure is included. The accuracy, precision, and sensitivity of the method are discussed. Comments are included on methods of sampling, precautions to be observed in the preparation and use of evacuated sample bottles, the effects of impurities in reagents, the duration of persistence of available hydrogen peroxide in sample bottles, and the use of photoelectric colorimetry in connection with the method. -- Authors' summary.
- The Study of the Dust Content of a Gas. J.C. Jaeger. Australian J. Sci., 5, 1-12 (1942).
A discussion of the filtration, thermal precipitation and jet methods of dust analysis with notes on the determination of the amount and particle size of dust in producer gas.

- 604 Experience Gained in Sampling. 7th Report of the Coal Dust Research Committee of Monmouthshire and South Wales Coal Owners' Assoc. (December, 1942).
For the sampling of air-borne dusts in coal mines the Committee favors the Soxhlet thimble filter method. Observational results are given which show the variations that occur in the dust concentrations in any working place during the course of a shift. If representative samples are required for any place, sampling should be carried out over the period of the whole shift. Trays were exposed for set periods to glean information as to the rate at which dust was deposited in the workings, and as to the amount and frequency of stone-dusting needed to render a district safe from coal-dust explosions. Attention is drawn to various inaccuracies that may arise in samples taken by konimeter, and the doubt is expressed whether the konimeter is the appropriate instrument for use in investigating coal dust hazards.
- 605 Limitations to the Use of the Konimeter. C.S. Chubb. 8th Report of the Coal Dust Research Committee of the Monmouthshire and South Wales Coal Owners' Assoc. (February, 1943).
In British coal mines the Zeiss konimeter has been the principal instrument used for sampling dust clouds. The author of this paper draws attention to numerous defects in the Zeiss instrument as sold in Great Britain and gives experimental data to illustrate his contentions. The konimeter does not collect all the dust contained in the volume of air sampled, but has been assumed to give a dust count proportional to the true concentration. More care needs to be given to standardizing the preparation of the collecting slide. The microscope supplied by Zeiss is not standardized: variations occur in objective, tube length, eyepiece, and overall magnification. The konimeters themselves vary. Some have a filter over the inlet, and others have not. There are two very different kinds of filters. The jet varies, and the vent from slide chamber to the pump barrel is not standard. The pumps in different instruments vary greatly in velocity of travel (as 4 to 1), and the distance of the slide from the jet also varies. Observations show the large effects of these variations which make the results obtained of little value. If the konimeter is to be of any use in coal mines it must be standardized very carefully, and the whole technique must also be looked into. Walton's optical method of evaluating konimeter spots may give widely divergent results. With such high dust concentrations as occur in coal mines the efficiency of the konimeter is reduced, for there is a spreading of dust to other parts of the slide. This seems to be a fundamental objection to the use of the konimeter in dust concentrations exceeding 1,000 particles per cc. It is suggested that the midget impinger would probably be suitable for use in British coal mines.
- 606 Efficiencies, for Particle Determination, of the Electrotor Meter, the Ultra-microscope, and the Settlement Counter. S.C. Blacktin. J. Soc. Chem. Ind., 61, 161-162 (October, 1942).
The experiments were made with magnesium oxide smoke of particle diameter 0.4 to 2 microns and with match-head smoke of diameter 0.8 to 4 microns. The superior count efficiency of the electrotor meter compared with the other two at the lower end of the range is explained, as also the way in which that instrument avoids particle aggregation by its rotating deposit record and variation of the deposition area.

Control Methods

- 607 Industrial Ventilation. Anonymous. Nat. Safety News. 47, 91-92, 98-99 (March, 1943).
This article is a brief discussion of the important factors involved in industrial ventilation. Suggestions for maximum efficiency from natural ventilation are given. Forced ventilation is discussed briefly. Some requirements for local exhaust systems are summarized.
- 608 Disk Fans Solve Troublesome Ventilating Problems in a Chemical Plant. W.J. Shore. Chem. & Met. Eng., 50, 116 (March, 1943).
This article describes the use of a disk fan to provide adequate dilution of a chemical process which could not be ventilated locally. An illustration is given showing where the fan and air inlets were located to correct the conditions.
- 609 Industrial Ventilation in War: A Review. T. Bedford. Bull. of Hyg., 18, 91-100 (February, 1943).
This is a concise review of recent British and American work on ventilation requirements for the control of thermal factors and the removal of odors and toxic substances from the air. Aside from the thermal factors, the ventilation requirements in the two countries do not differ much. A fresh air supply of 1000 c.f.h. per occupant is accepted as the minimum desirable for the control of body odors. Much greater air quantities may be needed in industries to reduce the concentration of toxic dusts, fumes and gases below the danger threshold. Little reliance is placed on ozone as a deodorant and in ultraviolet light as an aerial disinfectant, particularly when air-borne organisms are associated with dusts. Ultraviolet light and bactericidal mists are believed to be of value in air raid shelters and other places where proper spacing and ventilation cannot be achieved. Last, but not least, routine observation of atmospheric pollution, and supervision of ventilation systems are most essential.
- 610 Respiratory Protective Equipment. Anonymous. Nat. Safety News. 47, 20, 52, 58 (March, 1943).
This is a general discussion of the types of respiratory protective equipment; proper usage and limitations are outlined.
- 611 Use of Carbon Dioxide-Oxygen Mixture in Low Barometric Pressure. V.M. Tarasenko. Klin. Med. (Moscow). 19, 39 (1941).
The author points out that oxygen inhalation alone is not enough to prevent hypoxemia in aviators flying at an altitude exceeding 12,000 meters. Inhalation of a mixture of oxygen and carbon dioxide increases the amount of oxygen liberated by the tissues and thus to some extent compensates for the deficiency of oxygen in the inhaled air. The author carried out forty-six experiments on 16 individuals in the low pressure chamber. The atmospheric pressure was reduced to correspond to an ascent of 10,000 to 13,000 meters above sea level. In the majority of cases the carbon dioxide-oxygen inhalation stabilized the cardiac rhythm, maintained pulmonary ventilation at a higher level and increased the subjective sense of well-being as compared with oxygen inhalation. Thus, inhalation of the mixture containing gradually increasing percentages of carbon dioxide corresponding to a decreasing barometric pressure preserves the carbon dioxide of the organism and facilitates a more complete utilization of oxygen by the tissues. This was demonstrated by the maintained working capacity and the absence of any definite changes in the composition of the urine. Tarasenko attributes his three negative results to an inadequate dosage of carbon dioxide.

Industrial Medical Practice

- 612 Aviation Medicine. C.C. Shaw. U. S. Naval Inst. Proc., 68, 1264-1273 (1942). The forces exerted on the body by flight are reviewed. Nitrogen is more soluble in the fatty tissues of the body. Protective devices are discussed.
- 613 The Burn Problem. I.S. Ravdin. Am. J. Surg., 59, 330-340, (February, 1943). The immediate therapy for burns is now fairly well agreed upon and consists in general of the following: (1) Enough morphine to relieve pain. (2) Sufficient plasma, serum or albumin to restore or maintain normal physiological function. (3) Precaution against infection. The local treatment of the burned area, however, is still hotly debated. These problems of local treatment are briefly discussed: (1) Debridement should be a moderate treatment and strictly aseptic. Good white soap and sterile saline are recommended. (2) Local tanning probably inhibits repair, but it also prevents excessive evaporation of plasma, and therefore its advantages and disadvantages must both be considered. It should not be used, however, on the face, hands or genitalia. (3) A new but promising therapeutic measure is the use of pressure bandages with a bacteriostatic agent. (4) Local application of one of the sulfonamides will reduce the incidence of infection and make unnecessary further oral therapy. If the renal output is low, however, these drugs may crystallize out in the urinary tract, causing anuria. (5) Third degree burns should be grafted as soon as possible. In general, it is important to realize that burns are wounds, and should be treated on the same fundamental principles that wounds are treated. Following the article there is an extensive discussion of the "burn problem", including debridement, shock treatment, treatment of an eschar, oil burns, and an outline for the complete care of a burned patient.
- 614 A Method for Handling Cases Gassed with Nitrous Fumes. A.J. Fleming. Ind. Med., 12, 127-132 (March, 1943). There are two periods of anoxia following nitrous fume gassing. The first follows immediately after exposure and is due apparently to a spasm of the terminal bronchioles and an upset in the Hering-Breuer reflex, interfering with the aeration of the lung and causing acute circulatory collapse. The second period is associated with the development of severe pulmonary edema. Blood platelet counts made on venous blood, if possible, are a very reliable index of the severity of gassing by lung irritants such as nitrous fumes. If a marked elevation in the count takes place immediately after exposure, it is a good indication that severe pulmonary edema will follow. The changes noted in respiratory rate, blood pressure, the oxygen content of the arterial and venous blood, and the early lung pathology in nitrous fume poisoning are very similar to those already described in phosgene poisoning. -- Author's summary.
- 615 Tuberculosis Case Finding in Industry. I.R. Tabershaw. Ind. Med., 12, 133-136 (March, 1943). Industry is the most logical place to combat the war-time increase in tuberculosis. The best method of combat is by mass surveys carried on by the use of 4x5, or 35-mm., fluorographic technique. The function of the survey should be to remove only those cases which are dangerous to the surrounding contacts; that is, minimal inactive lesions and healed lesions should not be reported. The difficulty in such a program is obtaining the coordination and assistance of not only the employee, but also the employer, the labor union, and the insurance company.

Legal responsibilities must be fixed, and laws regulating the compensability of tuberculosis must be defined. The chief method, however, is still the same: educate the worker. He will then demand health protection from his employer and his union.

- 616 Shock. Its Nature and Therapy. D.W. Wheeler. U.S. Naval Med. Bull., 41, 93-106, (January, 1943).

The author defines shock as a symptom-complex resulting from "progressive vasoconstrictive oligemic anoxia." Its immediate cause is loss of blood volume by vasodilatation, hemorrhage, or plasma loss. Symptoms are anxiety, thirst, rapid, thready pulse, and cold, moist, cyanotic skin. Primary and secondary shock are differentiated. The former appears sooner and is characterized by a slower pulse and a warmer skin. Shock, initiated by a loss of blood volume, is continued by a series of physiologic disturbances: (1) Decreased venous return. (2) Decreased cardiac output. (3) Reflex vasoconstriction. (4) Hemoconcentration. (5) Fall in blood pressure. This appears late in the syndrome and is an inadequate guide as to the state of circulation in incipient shock. (6) Ischemia and anoxia. When this stage is reached, compensatory factors have failed, and the one most important feature of shock is present: its irreversibility. The therapy of shock is the adequate replacement of fluids of the proper type. Plasma, whole blood, or serum should be used, and considerable quantities are often required. Blood plasma is therapeutically equivalent to blood in hemorrhage, and therefore plasma is as effective as whole blood in the treatment of shock in humans. Dried plasma is recommended and its collection, advantages, and disadvantages are discussed. The disadvantages are mainly that it must be filtered before use and that there is a considerable chance for contamination. Other adjuvants of therapy are warmth (not heat), adequate oxygen, possibly adrenal cortical substance and a well balanced diet. Prevention of shock is the most important part of therapy, and this includes replacement of fluid before irreversible changes occur.

- 617 Treatment of Epidemic Keratoconjunctivitis. Preliminary Report of Ten Cases. A.E. Braley and M. Sanders. J.A.M.A. 121, 999-1000 (March 27, 1943).

The present widespread occurrence of epidemic keratoconjunctivitis in important industrial areas and the failure of all types of therapy justify the focussing of attention on the use of convalescent serum as a possible means of treatment. In the present group of ten cases, nine showed striking clinical improvement a short time after intravenous injections of human convalescent serum were given. However, need for a controlled group of cases cannot be stressed too strongly. It has been pointed out that there is no correlation between the intensity of clinical symptoms and the duration of the disease. It should also be remembered that it is highly desirable that the present study be enlarged, from the point of view both of treated and of control cases, and that standard, accurately titered convalescent serums be employed.

- 618 The Role of Dentistry - In an Industrial Medical Program. E. Goldhorn. Ind. Med., 12, 322 (May, 1943).

It is the author's opinion that a comprehensive dental program for industry can not be attained because of the magnitude of the problem, and that all phases of restorative dental procedure should be referred to the worker's own dentist.

- 619 Supervising the Woman War Worker. National Foremen's Institute, Inc., Deep River, Conn. 34 pp. (1942).

A list is given of about 95 jobs that women are doing and more than a thousand that they can be trained to do. Subjects discussed in relation to the employment of women are: hiring, induction, wages, uniforms, safety, reprimand, and teaching. Opinions of a personnel manager, an industrial leader, and the editors of the booklet agree that there are practically no limitations in the employment of women and no major problems and that they are doing a good job productively.

General Motors Medical Conference, Detroit, Michigan. April 9, 1943. Ind. Med., 12, 255-280 (May, 1943).

Following opening remarks by H.W. Anderson, outlining the general field of the conference, the following papers were presented.

Examining Women in Industry. D.D. Frame. pp. 266-269.

Women are more apprehensive than men, and examinations should be as thorough as possible and yet free from embarrassment. They are usually less nervous when they know they will be examined by a woman physician. Special problems women bring to industry are: menstruation, menopause, pregnancy, and care of young children. The way in which industry handles the first three problems is discussed. Suggestions are made for the solution of the problem of the care of young children, which is the cause of much absenteeism.

The Doctor and Public Relations. D.P. Hogate. pp. 269-270

Public relations is defined as "Interpreting General Motors to the public to the end that more and more people will be favorably impressed with our company and our policies." The plant doctor, through his contacts with employees and in his home community becomes a public relations man. The first impression of the company, by new employees, comes from the medical department, and is given out to the public. Other opportunities which the plant physician may have for service in this field are: Through contacts with the local medical society; as a speaker before civic groups, luncheon clubs, etc.; writing occasional articles for the plant paper; watching for and correcting wrong impressions when heard in the office; making sure that his entire staff understands management policies and procedure.

The Industrial Dispensary - Processing Methods in Treatment. E.B. Lamb.

pp. 270-274.

The industrial dispensary must be constructed and maintained to meet the needs of a specific situation, which is made up of many variable factors. Some of these factors are: I. The Nature of the Industry to be Served. For example, a foundry should be equipped to handle burns; a machine shop should be prepared to suture cut fingers, to remove foreign bodies from the eye, etc. II. The Size of the Industry to be Served. In general, the work demanded will vary directly as the size of the plant personnel. III. Location and Distribution of Working Personnel. Place the dispensary as near as possible to the population it is to serve. IV. The Resources of the Local Community. In a major catastrophe, the resources of the community must be used, so should be known. V. The Floor Plan of the Hospital. Certain principles which should be maintained are stated. VI. Equipment and Its Use. Prepare for the unusual, to some extent. The need of a stock of blood plasma and retrieving equipment is possible. A list of a few fundamental essentials is given. A number of pictures illustrate the company's efforts to render service to sick or injured in plants. In conclusion, the personal contribution of the plant physician is emphasized.

The Clinical Laboratory - In Industrial Medical Practice. F.V. Kowals.

pp. 274-276.

Only recently has the clinical laboratory been made an integral part of the industrial medical department. The allotment of adequate space for the work is an important factor. A competent and industrious technician should be secured, who with the medical director decides upon the amount and type of equipment needed. Advantages and disadvantages which may be derived from a working clinical laboratory are considered. The author believes that the advantages and benefits it offers to the employer and the employee, as well as to the community justify its establishment.

Control of the Lead Hazard - In the Manufacture of Storage Batteries. A.W.

Allen and G. Winn. pp. 277-278

A health program was instituted in 1928 when the Delco Remy Division began the manufacture of wet storage batteries. This program was enlarged and developed, and in 1940 a rather broad program was adopted which covered matters of exposure,

determination and maintenance of safe limits of concentration and periodic checks both of the plant environment and the employees. In addition to this approach from the engineering standpoint, it was necessary to see that there was no human failure. Good personal hygiene was encouraged in various ways. Graphs are reproduced, which show the effects when conditions are improved. Another set illustrates the importance of good personal hygiene. Several factors which are likely to cause changes in plant environment are listed. Use of respirators is recommended where conditions cannot be improved immediately.

Practical Nutrition Program - For Industry. W.A. Sawyer. pp. 273-280.

The article gives the history of the nutrition program in the Eastman Kodak Company, from its inauguration in 1922. Early features were a comprehensive program of health education, studies of underweight and overweight groups, of between meal feedings and on the value of cod liver oil and vitamin A and D concentrates. In 1941 an effort was begun to assist the cafeteria management in the scientific aspects of good nutrition. The author believes that the plant physician should have some supervision, at least in an advisory capacity. Duties of the Nutrition Adviser and the Dietitian Manager are outlined. An increase in the number fed and in the average meal check was a result of improved conditions in one of the cafeterias. Work done under the clinical and the educational phases of the program is shown in a series of charts.

- 621 Physical Placement Program - For a Large Industrial Plant. A.C. Dick and others. Ind. Med., 12, 303-306 (May, 1943).

The labor shortage has made necessary the employment of physically handicapped workers. The placement program at the Consolidated-Vultee Aircraft Corporation is described. The two factors involved are the physical classification of the worker and the physical requirements of the job. The pre-placement examination is recorded in the form of a code classification, which indicates the worker's physical status. A thorough job survey discloses information which is codified for use in proper placement of employees. Physically fit workers must take jobs requiring physical perfection to make room for the others.

- 622 What Causes Industrial Fatigue? A. Gray. Iron Age, 151, 42-43 (April 29, 1943). The principal factors discussed are excessively long hours, inexperience and fear. Suggestions for their cure are presented.

- 623 Postgraduate Education of Physicians for Industrial Health Service. C.M. Peterson. Am. J. Pub. Health., 33, 541-544 (May, 1943).

Committees of the American Medical Association and American Public Health Association have developed a plan whereby industrial plants may obtain the regular services of a physician by application to a state committee if no local physician is available. This plan necessitates the rapid training of a number of industrial physicians, and the author suggests several means for such training and outlines its scope. A brief course of training is advocated for physicians experienced in general practice and for specialists whose talents fit them for industrial work. More extended study, with graduation, internship and preliminary practice as a background, may include 6 months' training in industrial hygiene and toxicology, 6 months' service in hospital practice, and 6 to 12 months' service in an approved industrial medical department. Establishment of fellowships, both for the short-term and long-term courses, would assist greatly. The duties and qualifications of county industrial health committees are listed. The committee should contain representation from private practice, industrial practice and public health services and the responsibility of the committee should be to see that each war production plant should have the services of an industrial physician, an industrial nurse, industrial hygiene service, a plant health program, and sickness and absentee records. The committee will also be expected to

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undertake any assignment or local situation which requires exercise of medical initiative and leadership. In many cases local health officials will benefit by the ~~same~~ kind of postgraduate training recommended for physicians.

- 624 Rehabilitation. Recent Developments in Connecticut. J.H. Biram. Ind. Med., 12, 146-148 (March, 1943).
A simple operation or a brief series of treatments will frequently make possible the rehabilitation of workers now unable to obtain jobs. In Connecticut in October, 1942, a committee was organized with this rehabilitation program as its goal. The committee was composed of representatives from industrial medicine, organized medicine, hospitals, manufacturers, compensation, and labor. The committee recommended and now functions under the following conditions: (1) Only defects needing relatively short treatment are to be attempted. These include cardiovascular disease, varicose veins, hernia, vision, minor orthopedic defects, and diabetes. (2) Patients are to come from plant physicians or rehabilitation offices. (3) Recommended "panel doctors" are to carry out the necessary procedures. (4) The client is to have his choice of hospital and panel doctor. (5) Expenses are to be met by a revolving fund, one-half from the state and one-half from the United States, and repayment is to be on the installment basis. As yet too short a time has elapsed to evaluate the success of this program.
- 625 The Employment and Placement of Handicapped Persons in Industry. H. Bartle. J.A.M.A. 121, 1002-1003 (March 27, 1943).
The full utilization of all manpower is necessary to keep production at a maximum. Adjustment to achieve this objective for the handicapped should include non-hazardous placement, postural therapy, sitting instead of standing, work in which eye strain is not demanded, deliberate work avoiding the highly repetitive operations for the nervous, and a great number of other factors arising in many and varied industries. -- Author's summary.
- 626 Who Can Work? D.L. Lynch. Ind. Med., 12, 145-146 (March, 1943).
Dr. Lynch points out that there are 23,500,000 persons in this country, outside of institutions, of all ages, who have some chronic disease or physical handicap. Of these, some 15,500,000 constitute a great reservoir of persons who can work for victory. There are positions for the blind, the deaf, the crippled, and those with missing or mutilated hands and arms. Employers must be willing to give these persons the right to work; industrial physicians must search for their abilities and recommend them for proper placement; and insurance companies must remove the barriers.
- 627 Control of Health in Industry. J.H. Foulger. Ind. Med., 12, 136-140 (Mar.1943).
The substance of this article is given in our Abstract No. 394 (April, 1943). The paper is titled "Important Factors in Industrial Preventive Medicine."
- 628 The Mental Health of Workers. Meyer Brown. Ind. Med., 12, 148-150 (March,1943).
Many of the accidents, frequent layoffs, and much of the damage to employee morale are due to workers with poor mental health of one type or another. Dr. Brown classifies the mental and nervous problems in industry into three basic groups: (1) Definite mental diseases. These employees are best handled by physicians who understand diseases of the nervous system. (2) Employees with a peculiar personality; i.e., those workers who always have and always will be considered "different" from the average person. Industry must learn to appraise the defects in these people, to correct them if possible and to so place them that their defects are not costly to production. (3) The so-called "normal" workers. The productivity of such a worker depends upon a triangle of forces; the personality of the worker, his environment away from work, and his environment at work. Most can be

accomplished by attacking the last two angles, and only recently has the importance of the off-the-job factors been realized. Intelligent, continued, and coordinated propaganda is the best means of controlling this factor.

Undergraduate Training of Industrial Hygiene Personnel. M.H. Kronenberg. Am. J. Pub. Health. 33, 545-549 (May, 1943).

The author believes that medical schools should adjust their curricula so that courses in industrial health may be organized and developed on a larger scale, even though they may not be able to cover the field fully in the undergraduate years. Procedures and methods should be comparable to other well organized courses in the curriculum. The few medical schools which have made this type of instruction available have demonstrated that a reasonable acquaintance with the whole subject can be provided at moderate expense through the judicious use of time and readily available teaching and clinical material. Results of questionnaires and surveys in medical colleges show some advance in interest regarding industrial health courses and some increase in the number of hours assigned. The following are essential requirements to be kept in mind when organizing the undergraduate program: (1) Required courses -- These should provide lectures, laboratory experience, industrial history taking, and record keeping, section work in wards and clinics, and field trips. (2) Elective courses -- Opportunity for more detailed and specific study, personal participation in special projects, individual study or personal experience in plant or laboratory. Full time and part time industrial physicians should be instructors in these courses. There are several guides published to outline the content of such courses. The author considers the second semester of the junior year the ideal time for this course. The elective course of 32 hours is placed in the senior year, and membership is limited to those who have shown particular interest in the required course. During the intern year, a short service in the medical department of some industry would be highly beneficial.

630 Industrial Medicine and the General Practitioner. D. Munro. The Practitioner. 49, 321-325 (December, 1942).

By agreement between the British Medical Association and the Association of Industrial Medical Officers, the respective spheres of the general practitioner and the industrial medical officer are defined. Duties of the general practitioner are not specified, but it is assumed that he owes an unwritten duty to industry and to the factory workers among his patients. He should have an industrial knowledge dependent upon the range of industries in his locality and he should be familiar with the working conditions of his patients. He should not express opinions on industrial disabilities without consulting his industrial colleagues nor be **hasty** in giving certificates of fitness for work. Cooperation with the industrial medical officer should help to improve the conditions of the worker.

631 How to Get Along with Less Help. Legitimate Short Cuts to Routine Service. E.C. Holmblad. J.A.M.A. 121, 820-822 (March 13, 1943).

The necessity for devising short cuts is indicated by the number of persons per physician in industry. Dr. Holmblad suggests several legitimate short cuts to routine service: (1) Up to date equipment. (2) Improved methods of treatment, such as having syringes, instruments and needles sterilized in advance. (3) Simplified records. This includes reducing the number of questions asked or recording only positive results. (4) Avoidance of unnecessary preplacement examinations. If such examinations are curtailed, special care must be taken of all symptoms or complaints registered while working. (5) A simplified preplacement examination. Dr. Holmblad also believes that the best method for supplementing the shortage of physicians and nurses is by the judicious use of technical assistants and nurses' aides.

- 632 Medical Care for Small Industries. Anonymous. Safety Eng., 85, 49 (May, 1943). The article tells of a plan being considered by a group of small industries in New York City to provide medical care for their workers on a cooperative basis, the service to be provided by an outside agency. The plan would supply the usual in-plant services and out-of-plant service as well. A close cooperation between these two services, through the medium of the central organization, is desired.
- 633 Health in War Plants. C.P. Engel. Safety Eng., 85, 41, 44-45 (May, 1943). The Westinghouse Electric and Manufacturing Company has a three-fold health program. The plant nutrition program embodies many of the best practices in current use. An unusual feature is the Health for Victory Club which has enlisted hundreds of mothers and wives in a campaign to achieve dietary perfection in home meals. The personal health program is well organized and careful attention is given to pre-employment, periodic and yearly check up examinations. Plant safety is considered of first importance and the industrial hygiene department is staffed with engineers and research chemists whose sole job is to find and remedy occupational hazards. Special attention is given to the placing of women and to their nutritional needs.
- 634 The Nurse's Records. I.M. Poole. Safety Eng., 85, 47-48 (May, 1943). The importance of records and reports, both to the nurse herself and to management, is stressed. Standard requirements of records are that they be accurate, concise, and confidential. A filing system is indispensable. Outlines are given for the individual record and for the general daily, monthly, and annual reports, which are considered essential for efficient record keeping.
- 635 Industrial Nursing Service -- A Suggested Yardstick for Judging its Efficiency. W.L. Ritter and P.H. Walden. Ind. Med., 12, 212-214 (April, 1943). 1. A list of duties normally assumed by nurses in small plants is given. 2. A statement is made of the relative amounts of time usually allocated to the accomplishment of these various jobs. 3. A statement is made of the volume of work normally expected of nurses in their various functions.
- 636 Food For Production. I.O. Dodge. Ind. Med., 12, 297-301 (May, 1943). Nutrition in industry is discussed in relation to present and future problems of food supplies and distribution, with possible increasing severity of rationing. Reference is made to a review of the literature by R.M. Wilder which shows that many persons are ill fed and that ill feeding can affect the prosecution of the war. H.K. Stieboling's survey showed that 45 million people in this country suffer from malnutrition. The need for adequate breakfasts and lunches is shown and also the desirability of between meal feedings, which should be chosen with the same care for a balanced diet as the food at regular meals. The treatment of persons who have a tendency to low blood sugar between meals is considered. An important means for improving the nutritional health of the worker is the cafeteria, preferably plant owned and operated.
- 637 Manual of Industrial Nutrition. Food Distribution Administration, Nutrition and Food Conservation Branch, U. S. Government Printing Office. (1943). This is the first in a series of pamphlets which will be prepared and distributed by the Nutrition in Industry Division, Food Distribution Administration, Washington, D.C. The organization of the division is explained, particular attention being given to the work of the industrial regional representatives. Addresses of Regional offices are printed on page 25 of the manual. Six chapters on various phases of the problem of industrial nutrition present a synopsis of the best principles and practices which have been formulated.

- 638 Nutritional Programs for Industrial Employees. Princeton University. Industrial Relations Digest, No. 13 (December, 1942).
Basis of the ideal nutrition program is a well balanced hot lunch at attractive prices, with adequate time in which to eat it. Concessionaires operate for profit, but many factories operate a plant cafeteria at cost, as a contribution to employee health and good will. Efficiency of plant cafeterias is increased by thoughtful layout of physical facilities, including washrooms and employment of a trained nutritionist. The value of this plan to management and workers is amply proven by British experience before and since the Factory Canteens Order, 1940 enforced it by law. Education by posters, pay envelope insert, free consultation with the company dietician etc. inculcates good eating habits. Most effective publicity is practical suggestions, menus etc. The management has found that between meal snacks to some extent at least compensate for skimpy breakfasts and lunches and eliminate mid-morning and mid-afternoon slumps in production. Lunch counters and mobile carts dispense coffee, milk, pastry, fruit etc. in more factories weekly. Regarding vitamin supplements there is general agreement that for long run health maintenance, vitamin concentrates should be secondary to education for, and provision of, adequate natural diets. Concentrates and synthetics have however been helpful in selected instances and are always indicated where deficiency is manifest. A few plants provide these at reduced or cost price, usually subject to order of the medical department. Companies with feeding programs state the value of such efforts in greater employee health, productivity, accuracy, improved morale and lessened absenteeism.
- 639 Effects of Diet Deficient in Part of Vitamin B Complex on Men Doing Manual Labor. R.E. Johnson and others. J. Nutrition. 24, 585 (December, 1942).
Fully described experiments on 10 subjects, including 5 controls, indicated that when men are doing hard physical work even for a few days, it is imperative that they have an adequate daily intake of the whole vitamin B complex if physical fitness is to be maintained. Of the vitamin B complex, thiamine alone will not maintain physical fitness of laborers, but brewers' yeast appears to be a complete and adequate supplement for a diet grossly deficient in the vitamin B complex. When the addition of vitamin B complex to a ration is indicated, yeast appears to be a sufficient source of all the necessary components.
- 640 Vitamin Survey of Normal Industrial Workmen. J.G. Schendorff and others. Am. J. Digest. Dis., 9, 188-191 (1942).
No case of clinical avitaminosis A, B or C was found in the 1265 men under study, although 64% had ascorbic acid levels in the plasma below 0.5 mg. per cent. Saturation with ascorbic acid, therefore, is not essential to health.
- 641 Good Food. And No Time Lost. Anonymous. Factory Man. & Main., 101, 92-93, 200-204 (May, 1942).
Rear Admiral E.J. Marquart, Commandant of the Brooklyn Navy Yard has set up a lunch program that is changing the eating habits of workers and is at the same time minimizing the idle time of the machines. The large number of workers and limited floor space made the usual methods of serving inadequate, so a new system was worked out in cooperation with the canteen company handling the feeding operation at the Yard. The system, similar to that of some air lines, provides a balanced, nutritious meal in paper cups and containers, which are fitted into apertures in paper trays. The menus are the product of careful study, with scientists at Columbia University analyzing them and advising on vitamin content. Details of the operation of the plan are given.

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