July 1941

FOUNDATION FACTS

This news-letter is issued monthly to member companies and trade associations affiliated with Air Hygiene Foundation. Its purpose is to report Foundation news and activities. Air Hygiene Foundation is a partnership of industry and science organized to protect the health of the 15 million workmen in heavy industry.

Vol. 3. July, 1941 No. 7.

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B U L L E T I N!

Name Changed to "Industrial Hygiene Foundation"

The Board of Trustees of Air Hygiene Foundation of America, Inc. announce the change of the organization's name to Industrial Hygiene Foundation of America, Inc. At the same time the Foundation, originally incorporated in Ohio in 1935, was reincorporated under the laws of Pennsylvania. Foundation members voted almost 4 to 1 in favor of the name change in a poll conducted some months ago. After this expression, legal steps were started and the charter was granted on July 23 in Pittsburgh. Reason for the name change is to more clearly describe the Foundation's expanding activities and membership services for the protection of employee health.

When the Foundation was organized emphasis was placed on silicosis, No. 1 industrial health problem at that time. The Foundation's scientific approach to that problem is credited with having helped calm the hysteria then rampant. With the rapid advances of industrial hygiene and the multiplication of new occupational health problems, the Foundation's work has steadily broadened.

A study is now underway, with the collaboration of the U.S. Public Health Service, to help reduce sick absenteeism which is costing the heavy industries alone about one billion manhours yearly. Other accomplishments include, continuing studies of X-ray techniques for large-scale physical examinations in industry; studies of the control of toxic fumes and gases, including proper precautions in welding; a research, now in progress, to develop further practical data on exhaust ventilation for employee health protection; investigations in "protector" dusts, including aluminum, to combat dust diseases.

A "storehouse" of industrial health literature has been built up at the Foundation's headquarters in Mellon Institute. Current literature is digested each month for the information of the members and to keep them posted on progress. This digest covers about 300 journals in a dozen languages. Industrial hygiene laboratory facilities are also maintained at Mellon Institute. The Foundation now has industrial hygienists spending most of their time in the field making surveys for member companies. These surveys show the presence or absence of potential health hazards. Where hazards are found, remedies are recommended.

Advances in technology plus defense-spurred production are increasing old health hazards and creating new ones. The Foundation's function is to help keep precautions apace with production for its member companies and their million workmen.

Sixth Annual Meeting -- Nov. 12 and 13

The Foundation's sixth annual meeting will be held at Mellon Institute, Pittsburgh, on Nov. 12 and 13. The program geared to produce practical data for today's needs, will revolve around the theme: Defend the Defense Worker! Program suggestions are now being received from members of the Board of Trustees and the Medical, Engineering, Legal and Membership Committees. Members are cordially invited to submit suggestions. Meanwhile, reserve Wednesday and Thursday, Nov. 12 and 13. Increased production increases health hazards.

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Half A Million Workers "AWOL"

Business and government report "Labor requirements are constantly climbing" --- defense production requirements had mounted last month (June) to 44 billion manhours, a jump of 16 billion since January -- a recent survey showed "Serious shortages of qualified workers in important shipbuilding, aircraft and machineshop operations..."

Yet, about one billion manhours will be lost this year in the heavy industries alone through sick absenteeism! That is equivalent to half a million workers in the industrial army behind the lines being "AWOL" from the all important task of preparedness production. To compensate for sick absences additional manpower must be secured or production lags. But such additions would not be practical, even if the necessary workers were available, since absences can't be foretold. Therefore----

Member companies are urged to take every possible precaution to combat the health hazards that increase with increased production. The average worker is losing about 8 days a year because of illness. For every day that figure can be reduced there will be a gain of 120 million manhours, equivalent to the services of 60,000 workers full time.

The Foundation's function is to help its members Defend the Defense Workers. The "helps" are summarized in the attached memo to members.

A construction job that does not include health protection is not a finished job. It is easier to change plans than plants. The Foundation can help companies "build in" precautions. Ask for information.

William S. Knudsen---"Safeguarding the health of our employees is, in my opinion, the greatest and most important task before us at all times.

Defend the Defense Worker!

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NWBB-00007187

Increased Production Means Increased Health Hazards, So ---

This memorandum is to advise you of the services for protecting employee health which are available through Air Hygiene Foundation, a strictly non-profit association of industrial concerns with headquarters at Mellon Institute, Pittsburgh. Most important of these services now are the Industrial Hygiene Surveys. The surveys, conducted for member companies at cost, disclose the presence or absence of occupational health hazards, such as, excessive silica dust, lead, chemical fumes, gases, skin irritants, etc. If hazards are found remedies are recommended. Surveys help protect companies against unjust claims which flourish in depressions. Other services include:

Medical and Engineering Research on industrial health problems is conducted at the Saranac (N.Y.) Laboratory, Harvard, Pennsylvania and Mellon Institute. Members share in the economies and results of mutually-supported investigations.

Plans for new plants, designs for exhaust ventilation, materials used in manufacturing, etc., are checked for health significance -- a double safeguard.

Sick Absenteeism studies help reduce the losses suffered by management and labor through illness. This practical plan audits absences and shows when-where-and why they occur. Sickness causes 15 times more absences than accidents.

A Digest of Industrial Hygiene literature is prepared for members each month. This "news service" covers about 300 journals in a dozen languages. It reduces hours of reading to minutes, keeps companies posted on progress.

Informative Bulletins are issued periodically giving practical plant data for conserving health, as, Use and Care of Respirators, Design of Exhaust Systems, Determination of Lead, Benzol, Industrial Dusts, Choice of Methods for X-ray Examinations, and legal bulletins on occupational disease laws and compensation.

Counsel on medical, engineering and legal problems is available within reasonable limits from specialists comprising the Foundation's professional committees.

Facilities include an industrial hygiene laboratory and hygienists at Mellon Institute plus an exhaustive library. The Foundation also works in close cooperation with the Department of Industrial Hygiene at University of Pittsburgh's School of Medicine, the U. S. Bureau of Mines, the U. S. Public Health Service and the research institutions listed above.

Tangible and Intangible assets include, lower compensation costs, less litigation, improved working conditions, improved employer-employee relations, public goodwill and even less spoilage and increased production.

Increased production demands increased precautions.
The Foundation helps provide the precautions.

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HAZARDS

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July, 1941.

Air Hygiene Foundation,
4400 Fifth Avenue, Pittsburgh, Pa.

DIGEST OF INDUSTRIAL HYGIENE
Literature--News--Developments

News Items

534 Prevention of Heat Sickness in Industry.
Attention to the use of salt in preventing heat sickness or heat cramps is now timely. Salt lost from the body through perspiration may be conveniently replaced by adding salt to the drinking water (0.25% or two heaping teaspoons per 10 quarts) or by supplying salt tablets near the drinking fountain. A number of reports state that the proper use of salt has practically eliminated heat cramps and heat sickness. The only possible harmful effects from moderate use of salt are in cases of heart or kidney disease, but distress and gastro-intestinal disturbances may result from excessive and erratic use of salt tablets by sedentary workers. Connecticut Health Bull., 55, 173, (June, 1941).

535 Office of Scientific Research and Development Established.
The Office of Scientific Research and Development has been created by President Roosevelt by Executive Order dated June 28, as a branch of the Office for Emergency Management. The functions of this Office are: (a) to advise the President concerning the status of scientific and medical research relating to national defense and the measures necessary to assure continuing progress in this field; (b) to serve as the center for the mobilization of the scientific personnel; (c) to coordinate, aid, and supplement the scientific and medical research activities of the Navy, War and other departments; (d) to develop broad and coordinated research plans, in collaboration with representatives of those departments. The fields of research include mechanisms and devices of warfare and medical problems affecting national defense. An important branch of the Office is a Committee on Medical Research, whose special function is to advise concerning the need for and character of contracts to be entered into with universities, hospitals, and other agencies conducting medical research activities; also to make findings and submit recommendations with respect to the adequacy, progress and results of research on medical problems related to national defense. Defense, p. 8 (July 9, 1941).

536 Safety Training Supervisor Appointed.
Laurence B. Tipton of Rutgers University was named by Secretary of Labor Perkins as Safety Training and Field Service Supervisor for the National Committee for the Conservation of Manpower in Defense Industries. This Committee was set up last June by Miss Perkins to provide safety advisory service to Government contract plants, and to aid in the speeding up of the National Defense program by keeping skilled and trained workers off the casualty list. Mr. Tipton will work with defense agency officials on safety training programs for workers and supervisors and will have the responsibility for the organization and development of

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programs for Defense Safety Engineering training at college level in principal industrial centers. Intensive courses in safety engineering, industrial hygiene occupational disease and industrial accident prevention will be offered. U.S. Department of Labor release.

Legal Developments

537 Occupational Disease Statute Held to Apply to Disease Contracted Prior to Effective Date of Act.
The employee in this case became affected with a disease of the bronchial tubes known as bronchiectasis, due to fumes and dust inhaled in the course of his employment. The Workmen's Occupational Disease Act of Indiana was passed in 1937. The employee was engaged in the employment in which he incurred his disease prior to that time. The contention was made that no award should be granted because the disease was contracted before the Act became effective. The Court rejected this contention. It stated that the Act provides for compensation for disabilities resulting from occupational diseases, and not for contracting such diseases. Although the employee may have contracted the disease before the Act was passed, he did not become disabled from the disease until a year after the effective date of the Act, and consequently he came within its provisions. Hirst vs. Chevrolet Muncie Div. of Gen. Motors Corporation (Indiana) 33 N.E. 2nd 773 (May, 1941). Occup. Hazards, 3, 28(July, 1941).

538 Compensation Granted for Mercurial Poisoning.
The claimant was engaged as a hatter for some time prior to October, 1931. His work required him to handle and come in contact with furs. These furs were treated with mercury. The claimant exhibited symptoms which included a toxic mercurial dermatitis, nervous manifestations which recurrently flared up acutely; marked tremors and general nervous and mental symptoms. The Court found that the claimant was suffering from, and totally disabled by mercurial poisoning, a compensable occupational disease under the New Jersey Compensation Act. The disease was found to have been contracted while in the course, and by reason of the claimant's employment, and an award for his disability was allowed. Horowitz vs. Rothenberg Hat Co. (N.J.) 18 att. 2nd 852 (March, 1941). Occup. Hazards, 3, 24 (July, 1941).

539 Bursitis Compensable as Occupational Disease.
The claimant's work consisted in pouring medicine into bottles and pasting labels on the bottles. She was employed for nine years prior to June, 1939. Previous to 1938 she did her work by pouring the medicine from a graduate which she held in her right hand. In 1938 a machine for filling and labeling the bottles was installed. The claimant placed the bottle in the machine with her right hand and took them off with her left. In 1935 her right shoulder began to hurt. In 1937 it grew worse, and in June 1939 she was found to be suffering from bursitis. Bursitis is a specified occupational disease under the Michigan Compensation Act when it is caused by a process involving continuous rubbing, pressure or vibration of the parts affected. The Court held that the facts in this case justified an award. Three judges dissented on the ground that bursitis is not an occupational disease in the occupation of filling and labeling bottles; that the process required under the act did not include the process used by the claimant in this case. Kalee vs. Dewey Products Co. (Mich.) 206 N.W. 826 (March, 1941). Occup. Hazards, 3, 24, (July, 1941).

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540 Complete Recovery from Occupational Disease. Inability to Return to Same Occupation. Right to Compensation.
The question is whether the minimum compensation rate of $8.00 per week contained in Workmen's Compensation Law, Sec. 15 subd. 6 applies to an employee who had fully recovered from an occupational disease but who to avoid recurrence is unable to return to her former occupation and whose wage earning capacity in her new occupation is less than it was in her former occupation. The portion of the Workmen's Compensation Law dealing with occupational diseases is found in Art. 3. Sec. 39 of such article treats of disability or death caused by occupation diseases. The method provided in Sec. 39 would give her compensation at the rate of $7.45 per week. Consequently the board erred in applying the minimum rate of $8.00. The findings do not show the amount of reduction in earning capacity, nor the actual earning capacity of the claimant after her recovery. Such failure compels us to reverse this award and remit the matter for the preparation of proper findings. The award is reversed and remitted. Matter of Spang. N.Y. Supreme Ct., App. Div., 3rd Dept. Decided July 2, 1941. (CCH).

541 Pneumoconiosis. Resulting Tuberculosis. Improper Ventilation. Negligence of Employer.
Appellant charges that he became afflicted with pneumoconiosis, and in addition thereto that by reason of the weakened condition of his respiratory tract he also contracted tuberculosis. The court directed a verdict for the defendant. Any occupational disease which is the proximate result of the negligence of the employer is actionable and any occupational disease which is not the proximate result of the negligence of the employer is not actionable. Appellee contends that appellant failed to prove appellee guilty of negligence proximately causing the disease with which appellant is suffering. The evidence shows that appellant worked in the same room under the same conditions for seven years, at an emery grinding machine which never at any time was equipped with any kind of blower system or exhaust fans to carry off the dust. The dust was thick. No windows or ventilation of any kind existed. The medical testimony was that pneumoconiosis is a lung disease caused by dust, one form of which is silicosis which results from breaching dust containing silica; and that appellant is permanently and totally disabled by reason of the disease. Judgment reversed with instructions to sustain appellant's motion for a new trial. Dean v. The Dalton Foundries, Inc. et al. Ind. App. Ct. Decided May 27, 1941. (CCH).

Papers on Dust, Gases and General Industrial Hygiene

542 Pneumoconiosis in Coal Trimmers. J. Gough. J.Path. & Bact. 51, 277-85 (1940).
The autopsy findings in 12 Cardiff steam coal trimmers are reported together with their clinical histories. All showed evidence of pneumoconiosis and 5 had died of this disease. The pulmonary fibrosis was of two types, massive and nodular. The nodules differed from those of classical silicosis in being less densely fibrous and in showing radiating rather than concentric fibrosis. The lesions were similar to those found in miners working at the coal face in the mines from which the coal was obtained. While the residual silica was not high, the author feels that it played a part in the lesion. In his opinion Cardiff coal trimmers with prolonged exposure to sufficiently high concentrations show a pneumoconiosis similar to that recognized as anthracosilicosis in coal miners.

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U.S. PUBLIC HEALTH SERVICE

543 Artificial Respiration and Inhalation. Y. Henderson and J.M. Turner. J.Am. Med. Assoc., 116, 1508-14 (April 5, 1941).
All the manual methods of artificial respiration, as tested on conscious persons, induce the same volume of pulmonary ventilation. The principles controlling the volume are essentially the same as in ordinary breathing, namely the amount of carbon dioxide and oxygen in the blood acting on the respiratory centers which in turn influence the tonus, the diaphragm and thoracic muscles. The inhalation of carbon dioxide increases the volume of pulmonary ventilation with manual artificial respiration. It has been shown that the efficiency of manual artificial respiration is greatly increased and the patient is more rapidly resuscitated when carbon dioxide and oxygen are added to the air supply. Their presence is particularly necessary in treatment of carbon monoxide poisoning, in addition to immediate and constant respiration, so that sufficient oxygen is supplied and elimination of the carbon monoxide fixed to the hemoglobin is accelerated. Mechanical breathing machines not using positive pressure, such as the Drinker respirator, also depend upon control of pulmonary ventilation by the carbon dioxide and oxygen contents of the blood, and do not cause over or underventilation. Positive and negative pressure machines, on the other hand, are no better than manual methods in operation, and as a matter of fact, are very frequently distinctly harmful. These harmful effects result from: (1) loss of time in applying the apparatus, a difference of one minute being important; (2) lack of synchronization between the natural breathing and mechanical rhythm, thus actually impeding ventilation, and (3) possibility of overventilation, with a train of deranged physiological phenomena, often leading to death. The pulmotor is severely condemned by the authors.

544 Industrial Health Practices. A Report of a Survey of 2,064 Industrial Establishments. Conducted by National Assoc. of Manufacturers, Committee on Healthful Working Conditions, under direction of V. G. Heiser. 76 pp. (May, 1941).
A questionnaire was sent to each of 4,500 industrial companies, in order to obtain previously unavailable information about the value of maintaining health programs, to investigate prevailing policies in industry regarding physical examinations, to determine the frequency of specified services in industrial health programs, and to ascertain the age of factory health programs and the influence of size and type of industry on the annual per capita costs of such services. There were 1,500 replies received, covering 2,064 plants employing 1,945,551 workers. The summary reveals that a health program saves the average 500-employee plant $5,611 per year. All but 5 of a total of 1,625 respondents considered their programs paying propositions. Over 90% of those replying indicated reductions in accident frequency (44.9%), occupational disease (62.8%), absenteeism and compensation insurance premiums (about 29% each). A slightly smaller percentage indicated reductions in labor turnover, amounting to 27.3%. Most concerns use physical examinations as a means of determining proper placement of employees but do not unwarrantedly discriminate against applicants on the basis of the results of these examinations. Only 4.4% of applicants in 1,154 plants were rejected on account of shortcomings disclosed by the examinations. Eighty percent of 1,388 plants reporting their policy have a system of rating examinees for jobs. In 41% of 1,455 plants, including all organizations employing 20,000 or more, physical examination records are kept confidential. Among 23 specified items listed as important components of a factory health program, over 80% of the 2,064 plants in the survey provide an accident prevention program, exhaust ventilation, and a plant housekeeping and sanitation program; 70-80% pre-employment examinations of factory employees, 60-70% full illness and absence records, 40-50% periodic checks of examinations of factory employees and, 30-40% health education and presence of a doctor at scheduled hours. Forty-three per cent of the plants reporting had established their health services

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during the past depression decade and 70% of those established during the past 5 years were in plants having less than 500 employees. An average per capita cost of $5.17 was reported for plant medical programs, $3.34 for safety programs and $3.41 for industrial hygiene programs. The per capita cost of medical programs decreases as the number of employees increases. In addition to more detailed presentation of this material, several appendices contain a copy of the questionnaire and detailed tables of data from the replies.

545 Physical Fitness. E. Jokl and E.H. Cluver. J.Am.Med.Assoc., 116, 2383-9 (May 24, 1941).
The results of the investigations by the authors are a challenge to the conventional methods of determining fitness and employability. A sample group of 32 young men in South Africa were unable to obtain or retain employment, although they had all received primary education and were free from all diseases which would brand them "unfit," according to all standards established by labor and recruiting offices and army medical corps. The reasons for their condition were demonstrated by physical performance tests to be low strength and skill, due to poverty and consequent unsatisfactory diet, bad housing and poor general standard of living. Their physical condition and failure in work resulted in dullness, bitter mental attitude and lack of initiative. A special camp was established under the direction of the South African Defense Force for the purpose of training young men suffering from the handicaps described. The men underwent a six months course of training under military discipline, with stress on physical training and drill. Physiologic, postural, anthropometric and physical performance tests, made frequently, showed a rapid rise toward normal levels, and the men's mental attitude improved likewise. Suitable employment at normal wages was provided for 90 per cent of the men thus trained, and an analysis of pay sheets for a sample group of these workers for four years showed that they had achieved full economic rehabilitation. The authors also conducted an extensive study of the growth in physical efficiency of a group of children between 5 and 20 years of age, including English, Afrikander, Jewish, Bantu, Cape Colored, Indian and Chinese. The similarity between standards of physiologic performance of the different racial groups was striking. The effect of puberty on the growth of physical efficiency is noteworthy. It is desirable to collect more evidence on the relationship between subclinical nutritional deficiencies and physical efficiency. The terms "fitness" and "efficiency," generally very loosely applied, should be considered with the question "fitness and efficiency for what?" To illustrate this point, the authors cite instances of remarkable athletic ability in specialized fields, in persons with severe physical defects, some evident at once and others discovered only after death. The authors believe that the only satisfactory measure of fitness for employment is physical performance, and predict that theories and concepts of physical fitness will change when more physiologic and clinical experiences in this field are presented in the medical literature.

546 Briggs Never Stops Fighting Occupational Diseases. R.G. French. Amer. Business, 11, 18-9, 48-9 (April, 1941).
This is an account of the experience of the Briggs Manufacturing Company in combating occupational disease. In the plant with 20,000 employees, two physicians, two technicians and one chemist devote their full time to hygiene. All new materials are examined for toxic constituents. Lead dust, mostly from grinding operations, is removed by a push-pull ventilating system, and all the usual precautions against lead poisoning are observed, an aid to which is a printed employee's handbook containing all rules. Air samples are taken frequently. Special allergies are noted, and analysis for possible sources of dermatitis and change of occupation for sensitive persons has reduced such trouble to a minimum.

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The physical examination program includes watching for communicable diseases and preventing contagion. The program has repaid the company in maintaining health in the city, in promoting steady employment, in contributing to a better product and in providing insurance against the possibility of occupational diseases.

547 Absenteeism in Industry. R.D. Mudd. Trained Nurse & Hosp. Rev., 106, 344-50 (May, 1941).
The problem of absenteeism is fully discussed with reference to (1) general importance, (2) records, (3) distribution and (4) control. The gravity of the problem is now increasing on account of national defense. The author feels that it is important to record every absence regardless of its length. Every absent employee should be interviewed by a nurse or doctor prior to his return to work. The records should be complete, and should be recorded on a master sheet in addition to individual records so that they can be studied monthly or yearly. Distribution of absences according to a number of factors is discussed fully with the aid of data and charts compiled by W.G. Hazard of Owens-Illinois Glass Co. The records show that 86.5% of all absences are of less than 8 days duration, and 71.1% less than 4 days. Although the short absences comprise a small percentage of total time lost, they should receive full consideration, on account of possible contagion, especially in respiratory affections, turnover and expense to the employer. Not more than 1% of absences are due to diseases legally classified as occupational, and absences on account of non-industrial accidents are 6 to 10 times more frequent than those caused by industrial accidents. Absences increase slightly in frequency with age, but the length of disability increases in a greater ratio. The following factors in control of absenteeism are discussed: (1) amount of checking of absences; (2) occupational exposures; (3) physical examinations; (4) medical and surgical first aid; (5) control by private physicians; (6) control in small industries; and (7) reporting to established agencies. The nurse and physician can and should exert an influence on lowering absence rates. The more absences are checked, the fewer there will be. Proper supervision of safety and of health hazards lead to greater care at home and elsewhere as well as at work. Physical examination and records associated with first aid treatment disclose conditions that will guide the private physician in correcting them. The private physician should return the patient to work the day he is well, and in the author's opinion insurance for Sunday disabilities should be discontinued, decreasing the number of absences between Thursday and Saturday. Visiting Nurse Associations for small plants, and cooperation with State and National agencies in reporting absences, are recommended.

548 State of Maryland, First Annual Report of the Medical Board for Occupational Diseases, Industrial Accident Commission, for the Period June 1, 1939 to October 31, 1940, Inclusive. 75 pp. and 10 unpaged tables. 1940.
This report presents a complete analysis of the 391 claims filed with the Maryland Medical Board for Occupational Diseases, during the given period. They are classified according to occupation, industry, type of disease, and disposition of the claim. Of the total of 334 claims that were awarded, 186 were for dermatitis, 70 for disabilities from blisters or abrasions, 35 for bursitis or synovitis, 13 for lead poisoning or its sequelae and 1 for silicosis. The tables are followed by digests of the 36 claims that were formally brought before the Medical Board.

549 Neuropathologic Syndromes after Electric Trauma with a Note on Late Sequels. F. Scheiffahrt. Dtsch. Ztschr. f. Nervenheilk. 151, 153-70 (1940). (German).
The author reports several cases of after-effects of electric shock on the nervous system. The symptoms are quite varied in the different cases, but all can be considered as indicating damage of certain sympathetic ganglions or "vegetative paralysis."

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NIOSH Publications Available
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550 A Chemical and Physiological Investigation of Electric Arc Welding. III. Coated Welding Rods. C.P.McCord, G.C.Harrold and S.F.Meek. J.Ind. Hyg. & Toxicol., 23, 200-15 (May, 1941).
In continuation of their work on electric arc welding (Abstracts No. 783, November, 1940 and 456, June, 1941), the authors now report their results on coated rods. Rod coatings vary materially in composition and some with the simplest composition were used in the experiments. The principal elements found in the coatings and fumes, in addition to those from the bare rods, were silicon and titanium. The quantities of nitrous gases and ozone in fumes from coated rods were lower than from bare rods, but the metallic fumes (iron and manganese) were much more abundant, especially the manganese. The animals (rabbits and albino rats) were exposed for 6 hours daily for 46 days out of a total of 64 days, to fumes from welding 12 minutes at half-hour intervals. Contrary to findings from bare rods, growth rate disturbances were encountered. Substantial quantities of methemoglobin werefound in the blood of exposed rats, and its presence was established in the blood of welders. A few additional experiments on bare rods also disclosed methemoglobin in the blood of the rats. As in the case of bare rod experiments in which large quantities of nitrous gases were evolved, no evidence whatever accrued, relative to pulmonary edema, severe respiratory tract inflammation or similar findings, traditionally associated with nitrous gas action. Rats injected intraperitoneally with welding fume dust exhibited inert reactions, while those injected with silica dust presented characteristically proliferative reactions.

551 Nystagmus in the Dutch Coal Districts. Economic Factors and Photometric Investigations. J.W.C.Verhage. Ophthalmologica 100, 266-76 (1940). (German).
The author presents statistics on nystagmus in the Dutch coal mining areas and shows that the number of declarations of work disability is influenced by the economic situation. As the most probable cause of nystagmus is defective illumination, photometric measurements were made in the mines under various types of illumination. Results showed that the cap lamp is the best illuminant.

552 An Automatic Carbon Disulfide Recorder. Ben E. White and W.R. Calvert. J. Ind. Hyg. & Toxicol., 23, 196-9 (May, 1941).
A simple and inexpensive carbon disulfide recorder is described. It is based on the colorimetric analysis of carbon disulfide with copper acetate and diethylamine in methyl cellosolve. When hydrogen sulfide is present it is removed by passing the air through alkaline cadmium chloride before it enters the absorption cell. Two Zenith pumps, which are generally available in rayon plants, may be used, one to handle the absorbing liquid and the other to force the air through the liquid. Use of this recorder obviates the need of routine manual sampling, and it gives a permanent record of the carbon disulfide concentration at all times.

553 Effective Temperature Scale. A Measure of Human Comfort in Environmental Temperature. M.B. Ferderber and F.C.Houghten. J.Am.Med.Assoc., 116, 474-7 (February 8, 1941).
This is a review of the effective temperature index and its application to ordinary living and working environments in winter and summer.

554 Adsorption of the Early Products of Bovine Tubercle Bacilli in Rabbits by Anthracite Dust. S.L. Cummins. Brit. Med. J., pp. 623-4 (1940).
The author has devised a method of intratracheal inoculation of an emulsion of living extremely virulent bovine tubercle bacilli, and the same emulsion with 0.2 g. of anthracite dust. The addition of the dust led to the survival of 5 rabbits, considerably longer than the controls (116 vs. 75 days) and to complete recovery in 1 to 6 months.

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555 Dust-Explosion Hazards in Plants Producing or Handling Aluminum, Magnesium or Zinc Powder. H.R. Brown. Bur. of Mines Inf. Cir. No.7148, (March, 1941).
This paper presents a review of the knowledge of the explosibility of aluminum, magnesium and zinc dusts, including the uses and manufacture, ignition temperatures, pressures developed, etc. At least 45 explosions of these dusts occurred from 1917 to 1939, including 12 in the last five years. They will probably be more frequent now, owing to the great increase in production. Water cannot be used to extinguish fires, as the dusts react with water. Extinguishers that disperse the dusts, thereby creating new and dangerous clouds, are also ruled out. The only method available is to isolate the fire and let it burn itself out, or to use inert dusts if the fire is small. The best protection lies in fire prevention, which must be emphasized in plants. Cleanliness must be observed, the dust must be kept dry, and flames and smoking must be prohibited. If heating is necessary, hot air should be introduced from outside the building. All machinery must be grounded so that static electricity does not accumulate and electric wiring must be of an approved type. The powder making section of the plant should be segregated and divided into small units, one story with roofs that lift easily. Supplies of dry sand, talc or a similar extinguisher should be kept ready in suitable locations, and fire companies should be warned not to use water in case of fire. Additional research should be carried out as soon as possible, as much remains to be learned about the explosibility of these dusts.

556 Rational Placement of Workmen in Industries: Examination of Physical Defects and Morphological Changes. G.A. Vigliani. Rass.Med.Ind., 10, 219-39 (1939). (Italian).
A discussion of the defects and changes which limit the possibilities for a choice of work, with special consideration of the occupations open to persons suffering from changes in the cardiovascular apparatus, arterial hypertension, and chronic affections of the respiratory apparatus and of the digestive system.

557 Parallel versus Individual Operation of Multicyclones. L.C. Whiton, Jr., Trans. Am. Soc. Mech. Eng., 63, 213-8 (April, 1941).
Tests were made on cyclone dust collectors singly and grouped with interconnecting ducts and hoppers. Results show that, with a damper-equipped cyclone of the size used in actual practice and operated under identical conditions of resistance and temperature, performance of the individual cyclone is representative of the group in the field. In the discussion following the paper, it was agreed that this conclusion should not apply to groups of more than 3 cyclones in parallel.

558 Industrial Air Analysis. A Description of Some of the Chemical Methods Employed in the Laboratory. W.J. Burke and others. N.Y. State Dept. Labor, Div. Ind. Hyg., Mimeographed, no date.
Various instruments are described, and chemical and physical procedures are presented, for laboratory and field analyses of air. Specific methods for determining the following substances are described: lead, zinc, and copper (alone or in combination), mercury, carbon monoxide, benzene, hydrogen sulfide, carbon disulfide, formaldehyde and halogenated hydrocarbons. Methods are also given for determination of combustible limits of various gases and gravimetric estimation of organic vapors when present singly or in known proportions. The physical methods include adsorption of organic vapors on charcoal, silica gel, etc., absorption of vapors and gases in liquid media, and various instrumental methods such as the carbon monoxide, hydrogen sulfide and combustible gas indicators, the Nordlander and Woodlander mercury vapor detectors and the Tebbens combustion apparatus for chlorinated hydrocarbons. The methods given are supported by references and experimental data which should be of great value to the industrial hygienist.

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NOV 1942 INDUSTRIAL HYGIENE ABSTRACTS

HWBB-0007396

559 Dural Metal Product and Cutaneous Ulceration. Queries and Minor Notes. J. Am. Med. Assoc., 116, 452 (February 1, 1941).
A young apprentice handling the alloy Dural (aluminum with 4% copper and 1% other metals) has had chronic ulcerative lesions, raising the question whether the metal may be responsible. None of the constituents is a common source of dermatitis, and although an individual sensitivity is possible, it is more likely that the lesions are caused by any one of a number of materials handled, such as machine oil, naphtha and degreasing agents, to which a new worker may be especially sensitive.

560 Silicosis from Porphyry. Contribution to the Knowledge of Subacute Silicosis. E. Gaubatz. Fortschr. a. d. Geb. der Roentgenstr., 62, 395-404 (1940).(German).
The author discusses the dangerous effects of granites, porphyries, basalts, etc., and presents case histories and pictures of silicosis in workers engaged for 9 months, 10 years ago in dry drilling in a tunnel through porphyry containing quartz and orthoclase in equal parts. Of the 6 drillers employed, 3 died of silicosis and 2 are suffering from medium to serious silicosis. Two workers employed in carrying away the material are still free of symptoms. Drilling and crushing under the conditions described result in silicosis over a period of 1 to 3 years.

561 The Effect of High Temperature on Body Functions. The Regulation of Body Temperature. H. Laurens. New Orleans Med. & Surg. J., 93, 283-288 (December,1940). Effects of High Environmental Temperature on the Human Body. P.H. Jones, Ibid., pp. 288-93.
These papers are reviews of the literature on the subject, the second dealing largely with metabolism and circulatory changes, heat utricaria, heat cramps and heat exhaustion.

562 The Silica Content of Tissues, with and without Silicotic Lesions. E.J.King and T.H. Belt. J. Path. & Bact., 51, 269-75 (1940).
The authors analyzed for silica the lungs of 35 persons exposed to siliceous dusts and the peribronchial lymph glands of 132 others without such exposure. The first group was found to contain silica ranging from 0.27 to 3.7%, while the upper limit of the normal was 0.2% of dry lung in persons without exposure. About one-half of the lungs of the series with an excess of silica dust showed silicotic nodules. The authors suggest that the difference may be due to differences in the nature of the silicotic particles. Silica in the lymph nodes of normal persons accumulates with age. The authors conclude that no direct association exists between the silica concentration and the degree of fibrosis, although the silicotic cases always contained over 0.2% dry weight.

563 Industrial Medicine as a Specialty and its Relation to General Practice. G. H. Gehrmann. Ann. Intern. Med., 14, 621-7 (1940).
A presentation of present day principles of industrial medicine as a specialty, based upon 25 years of experience in the chemical industry. Industrial medicine is a new specialty combining internal and preventive medicine and requires special training in the knowledge of chemical production, toxicology and the clinical manifestations of early chemical absorption. This specialty holds great opportunities for the protection and improvement of public health and should be better understood and correlated with the general practice of medicine.

564 Silicosis in Soft Coal Miners. B.G. Clarke and C.E. Moffet. J.Ind. Hyg. & Toxicol., 23, 176-86 (May, 1941).
Chest x-rays and occupational histories of 774 bituminous coal workers of the Southern Appalachian region were studied to determine to what extent silicosis is present. The physical examination and x-ray records of 774 steel plant

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workers in the Chicago district, selected to form a comparable age group, were studied as controls. The data, classified according to age, occupation, and number of years employed, are presented in a number of tables and charts. The comparison indicates a tendency of bituminous miners to develop presilicotic lung changes after prolonged employment. At the mine where the study was made 2% of the workers showed presilicotic changes and 1% showed nodulation in their chest roentgenograms. These changes occurred principally among undercutting machine operators and coal loaders. The shortest exposure period necessary to produce nodulation was observed in a rock driller who had worked at his trade 11 years.

565 Hydrogen Sulfide Poisoning in Cleaning Sulfuric Acid Tanks. T. Bauer and H. Berger. Arch. f. Gewerbepath., 10, 259-87 (1940).
Arsine poisoning occasionally occurs in cleaning sulfuric acid tanks or trucks. Two serious poisoning cases, one fatal (Abstract No. 860, December, 1940) followed cleaning such tanks. In the fatal case, examination of the tank air showed nothing, but after stirring the tank residue, the air contained 98 mg. of hydrogen sulfide and only traces of arsine. The author (Bauer) concludes that death was caused by inhalation of hydrogen sulfide, probably caused by reduction of the wet ferrous sulfate to ferrous sulfide by oil in the residue, followed by action of the acid on the sulfide. Berger disagrees with Bauer regarding the cause of the presence of the hydrogen sulfide, attributing it to action of the acid on thioarsenite formed from the arsenic trisulfide present in the residue and the sodium carbonate used to clean the tank. In reply, Bauer defends his own interpretation, but both agree in general on preventive measures, including: avoiding the introduction of organic material, removal of as much as possible of the residue, neutralization of the remainder with soda, filling the tank twice with fresh water, and working only with a compressed air helmet or with plenty of fresh air. Tests should be made for arsine, hydrogen sulfide, and nitrous fumes.

566 Chronic Hydrogen Sulfide Poisoning in Dogs. P. Moser. Arch. f. exp. Path. u. Pharm. 196, 446-54 (1940).
Hydrogen sulfide was inhaled by dogs for 7 hours daily, first 0.014 mg. per l., and later 0.15 mg. per l. At the lower concentration the dogs showed little change; at the higher concentration there was lachrymation, coughing and coryza. The animals were quieter than usual and displayed a form of nausea, especially on leaving the exposure chamber. No blood changes or loss of weight occurred. Two of the dogs had diarrhoea and one died showing pulmonary edema at autopsy. In fatal human cases, almost the only symptom found has been lung edema.

567 The Dust Retaining Ability of the Nose in Asbestosis. W. Ehrhardt. Arch. f. Gewerbepath., 10, 309-25 (1940).
The author examined the dust-retaining ability of the nose in 238 asbestos workers, using Lehmann's method. No constant relation between this ability and tendency to asbestosis could be discovered. The dust-retention capacity was below 40% in several men who showed asbestotic lung changes, but many others remained healthy in spite of a similar low capacity. The two men with severe asbestosis had a good dust retaining capacity. The author concludes that this test has no essential value and may be abandoned in pre-employment examinations of asbestos workers.

568 Radiation as a Factor in the Sensation of Warmth. F.C. Houghten and others. Heating, Piping & Air Cond., 13, 123-34 (February, 1941).
Tests were made in two identical experimental rooms, one heated with ordinary radiators and the other with warm air. The former was comfortable at an effective temperature about 1° lower than the latter, but the structural heat loss of the room heated by the radiator was 8% higher than the other.

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569 A Diving Apparatus for Life Saving Work. C.J. Lambertson. J.Am.Med.Assoc., 116 1387-9 (March 29, 1941).
The author describes an apparatus designed primarily for underwater rescue work, but applicable also for work in toxic atmospheres. A small tank for oxygen or nitrogen-oxygen mixture and rebreathing apparatus are carried on the worker's back. In front is a soda-lime container, and flexible tubes run from the partial face mask to the container and to the oxygen tank. A leather harness attached to the assembly has hooks for attaching weights if desired. Oxygen flow is regulated so that 2 liters per minute at atmospheric pressure is delivered for 25 minutes.

570 The Effect of Hypoxemia on Ventilation and Circulation in Man. E. Asmussen and H. Chiodi. Am. J. Physiol., 132, 426-36 (March 1, 1941).
Lowered oxygen content of the blood was induced in 3 men by partial carbon monoxide poisoning or by breathing a gas mixture poor in oxygen. The effects of lowered oxygen content of the blood, due to lowered carrying capacity and of lowered alveolar tension, were quite different. Lowered oxygen content caused no significant change in respiration or in cardiac output, while lowered tension caused a pronounced increase in ventilation and increase of cardiac output. These results are taken to indicate that the oxygen tension in the carotid body is the most important influence in inducing the change. Lowered oxygen content was followed by acceleration of the heart rate, which is explained as a compensation for the diminished stroke-volume (consequent) on capillary dilatation.

571 Air-Supplied Masks for Spray Painters. H. Bertram. Arbeitsschutz pp. 291-2 (1940). (German).
The need of personal protection in addition to local exhaust ventilation in paint spraying is emphasized. The two air-supplied masks most used in Germany, the Auer and the Draeger, are described, with illustrations. A belt at the waist has openings connecting with the compressed air supply and with the half-mask. A filter for the compressed air and a connection for supplying 2 or 3 workers are also provided.

572 A Study of the Nature, Growth and Control of Bacteria in Cutting Compounds. M. Lee and A.C. Chandler. J. Bacteriol., 41, 373-86 (March, 1941).
There is ample opportunity for bacterial infection from cutting oil through various contacts as it circulates through a plant. Although the authors do not regard infection as the primary cause of the skin affections observed, they tested the oil for bacteria. Counts ranged from 14½ million per cc. after 2 hours use to 25 million after 200 hours' use. All the bacteria seemed to belong to the genus Pseudomonas but are apparently of a new species, for which the authors propose the name Oleovorans. Laboratory trials of various coal tar disinfectants and other materials controlled the growth for only a day or so. Finally resorcinol was found to be effective. No bacteria were found after 24 hours, and freshly added bacteria were destroyed. A 1% solution seems to give complete sterilization and does not affect the oil, while a smaller amount prevents spoilage. No investigation of the effects on workers is reported.

573 Experimental Research in Workers in the Manufacture of Dry Batteries. E. Zanetti. Med. del Lavoro 31, 276-81 (1940). (Italian).
The author presents his results of examination of workers employed in making dry batteries (see Abstract No. 311, April, 1941). He found very few symptoms, and no characteristic ones, of manganese poisoning. In the blood of some workers he found no changes in the blood calcium or potassium, but small changes in the glutathione content.

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574 Size Determination of Invisible Particles. H. Halberstadt. Staub, No. 13, 151-79 (1940).
The author describes the x-ray method of size measurement of ultramicroscopic particles, including its theoretical basis, different ways of performing the examination, and the accessories employed. The electron ray method, similar to the first is described briefly. The electron microscope is merely mentioned; it is available in only a few laboratories.

575 Engineering Control of Dust with Special Reference to Respirators. A.D. Brandt. Bull. Am. Ceram. Soc., 20, 123-5 (April, 1941).
In this paper, presented before the American Ceramic Society, the author reviews the usual methods of dust control, with a brief description of the various types of respirators and recommendations for their care and maintenance.

576 The Occurrence of Silicosis and Silicotuberculosis among Casting Cleaners at the Soederfors Iron Foundry. S. Hedenstedt. Acta Tuberc. Scand. 14, 265-76 (1940). (Scandinavian).
Among 26 foundry workers, there were 16 cases of silicosis and 2 cases of silicotuberculosis. Incubation period was approximately 8 years. Masks were worthless. Indirect measures such as ventilation systems were more effective. Dyspnea may be slight while lung pathology is extensive. Increased red cell sedimentation rate is due to bronchitis. All cases were tuberculin positive. Physical symptoms either are absent or are not pronounced. Only in 2 cases were workers entitled to health insurance benefit. Silicotuberculosis is not to be regarded as tuberculosis, silicosis or their combination, but as a distinct pathological entity.

577 Clinical Evaluation of Disability in Pulmonary Diseases of Industry. E. Mayer. J. Am. Med. Assoc., 116, 97-100 (January 11, 1941).
The author discusses the numerous problems that arise in determining compensability for pulmonary diseases, in the light of his experience on the New York State Labor Department board of impartial consultants which reviews controversial compensation claims. Two types of problems present themselves: in one the disease is related to a definite industrial hazard, but it must be decided whether it is disabling; in the other, disability is recognized, but the question is whether the occupation is responsible. The author attacks these problems under the following headings: (1) etiology; (2) production of lung injury and its anatomic results; (3) recognition of pulmonary illnesses, and (4) how such illnesses produce pulmonary incapacity, particularly with respect to reliable clinical and laboratory procedures for determining such disability. Two illustrative cases are described. Three types of pulmonary function tests are cited and discussed in detail: (1) ventilation, or ability of the lung to inflate and deflate; (2) gas exchange tests which measure the oxygen debt, the oxygen deficit, and the oxygen unsaturation of the arterial blood hemoglobin; and (4) measurement of efficiency of the pulmonary circulation. In conclusion, the author submits a classification of disability grading: (1) phase of compensation, in which pulmonary fibrosis and emphysema are present to a considerable degree, but the emphysema is still compensatory and does not restrict capacity for moderate exercise; (2) latent decompensation, in which fibrosis and emphysema are extensive, with marked restriction of exercise capacity with dyspnea occurring regularly on moderate exercise; and (3) manifest decompensation, where the fibrosis and emphysema are associated with more or less dyspnea even while the patient is at rest.

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578 Possible Respiratory Irritant from Cotton Dust or Cotton Dyes. Queries and Minor Notes. J. Am. Med. Assoc., 116, 2449 (May 24, 1941).
The question is what irritating substance or dye may be present in khaki-colored cotton now being made for the government, as persons who handle this material suffer irritation of the nose and throat. The reply indicates the cotton dust itself, especially if it contains histamine, as the most probable cause. In England, byssinosis, a lung disease from cotton dust, is compensable. Irritation from any dye is most commonly manifest as dermatitis. The absence of dermatitis tends to exclude, but does not necessarily exclude, dyes as the source of respiratory infection. Sulfur brown dye and chromate dusts may be considered as possibilities, and allergens may theoretically exist in catechu. Several references on the effect of cotton dust are given.

579 Arbitration of Medical Bills. H.D. Sayer. Ind. Med., 10, 13-4 (January, 1941).
The author traces the development of the present New York State plan for arbitration of medical bills for occupational illness and injuries, and describes the method of operation of the law. He is convinced that the procedure for arbitration and settlement of medical bills now in effect, while not perfect, is the best system yet devised for the handling of the great and troublesome problem. It remains with the doctors themselves to keep it working satisfactorily.

580 A Survey of Non-Occupational Illnesses and Injuries in a Major Oil Refinery. N.K. Forster and Hazel H. Leedke. Ind. Med., 10, 1-5 (January, 1941).
Statistics are presented covering the extent of occupational and non-occupational illnesses and injuries in a large oil refinery during 1939, with special attention to respiratory diseases. The latter are responsible for 61.5% of lost time cases, and exceeded by far all other non-occupational diseases and non-occupational injuries combined. The highest incidence was in February, and prophylactic measures and study of working conditions at that period should be instituted with an attempt to reduce the incidence. Gastrointestinal disorders and the arthritic-neurotic group are next in frequency, and can be controlled by more rigid pre-employment examinations and periodical check-ups. Regarding injuries, over 3 times as many lost time cases were injured outside the plant as in occupational pursuits, and the days lost were nearly double. Reduction of non-occupational lost time illnesses and injuries can be achieved by more attention to the subject on the part of employers, especially by the visiting nurse. Routine checks by the nurse will also decrease the number of cases in which the family doctor certifies to an unduly prolonged disability. The average time lost by the worker has been reduced from 28 days to under 8 days a year in a relatively short time, through the efforts of industry, but present necessity for defense measures and the interest of the government in worker's health should stimulate industry to efforts to improve the worker's health still more.

581 Rehabilitation at Baton Rouge Refinery. J.L. George and C.E. Allen, Jr., Ind. Med., 10, 83-7 (March, 1941).
The authors describe the rehabilitation program at the Baton Rouge refinery of Standard Oil Company of Louisiana. The same problems were encountered, and met in the same general way, as have been reported by others, but a few additional points are noteworthy. In the case of the white employee the causes of disability from illness follow very much in the order of causes of death in the nation, namely heart disease, tuberculosis, etc. Among colored employees, syphilis is the chief cause of disability. White employees predominate in the group that require consideration due to industrial accidents, while the colored employees predominate in the group requiring consideration due to illness not attributable to their jobs. Disabled employees frequently make the best employees. A definite medical plan, thorough examination prior to placing employees in a remunerative occupation, and a perpetual inventory of disabled personnel are advocated.

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582 Chronic Arthritis and Re-Employment. J.G. Kuhns. Ind. Med., 10, 94-9 (March, 1941).
To the layman, chronic arthritis is most commonly associated with crippling of the spine or extremities and with serious disability. Rarely is it considered compatible with a fair measure of health and relative freedom of physical activity. So prevalent is this concept that it is very difficult for individuals to find employment. On the other hand, using the records of the Robert Breck Brigham Hospital as a yardstick, it would appear that only about one-fourth of chronic arthritics do not become re-employable in some capacity due solely to the severity of their arthritic condition. Contributing factors to the question of the probability of their re-employment include such considerations as occupational class and type of arthritis. Much more detailed and carefully collected data over a longer period of time are necessary for the successful elucidation of the many faceted problem of re-employment and chronic arthritis.

583 Medical Evaluation of Nutritional Status. IV. The Ocular Manifestations of Avitaminosis A, with Especial Consideration of the Detection of Early Changes by Biomicroscopy. H.D. Kruse. Pub. Health Repts., 56, 1301-21 (June 27, 1941).
Of 143 persons in a low income group, 45% had gross and another 54% had microscopic ocular lesions characteristic of avitaminosis A. The ocular condition was xerosis conjunctivae. Following administration of vitamin A as specific therapy to a part of the group, the conjunctival lesions in nine persons have now completely disappeared, as judged in all instances by biomicroscopic examination. In all others receiving therapy, the conjunctival lesions have markedly receded to the point of near disappearance. In all cases the striking feature is the very long period of time required for complete recovery, a matter of months even with therapy of high potency. Those persons not receiving therapy have shown no improvement. It is suggested that xerosis probably precedes night blindness as an early sign of avitaminosis A. For detection of early avitaminosis A, the biomicroscopic examination is recommended as a simple, convenient, objective method. When it is combined with gross examination, all degrees of xerosis may be graded according to severity and extent. The marked prevalence of avitaminosis A in this low-income group, objectifying and validating previous dietary data, suggests its relatively frequent occurrence in the population at large.

584 Economical Dust Control with Low Resistance Exhaust Systems. Part 4. Filter Connection and Fan Selection. F.F. Kravath. Heat. & Vent., 38, 33-5 (February, 1941).
In this installment the importance of proper connections for the filter and exhaust fan are discussed. When properly connected, the resistance loss across the filter is a large fraction of the overall resistance loss, but the overall loss may easily become several times the filter loss when the assembly is poorly designed. The size of the filter must be selected not only for performance but also for low resistance characteristics. It is false economy to scrimp on the size of the filter, as savings in first cost will be replaced by increased maintenance costs and power consumption. Size is an important consideration in fan selection also. For a series of similar fans, capacity is directly proportional to the square of the diameter of the fan wheel, and so a small fan must be operated faster than a large one. Other items discussed are frictional loss in the bearings, leakage, frictional resistance of the air moving over the fan parts, and shock losses. It is essential in order to secure the most efficient fan that we carefully select the proper size, the most efficient type and the best workmanship.

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585 Economical Dust Control with Low Resistance Exhaust Systems. Part 5. Summary-A Sample System. F.F. Kravath. Heat. & Vent., 38, 33 (March, 1941).
A model exhaust system, embodying the requirements outlined in the earlier papers, is described briefly and illustrated. The yearly saving over the cost of an "old" system having all the faults considered in the discussions, under normal operation, is estimated at $1,800.

586 Economical Dust Control with Low Resistance Exhaust Systems. Part 6. Plenum Chamber Systems. F.F. Kravath. Heat. & Vent., 38, 36-8 (April, 1941).
This paper concludes the series, including Abstracts No. 15, 18, 19, January, 1941 and No. 584 and 585 in this Bulletin. In pneumatic design of branched systems, it is important to maintain low resistance between the branches and the outlet, in order to secure equal velocities in the branches. This condition is attained at its best by use of a plenum chamber, which consists of a large box or tank under pressure or suction and from which the various branch pipes emanate. Since there is no appreciable velocity within the chamber, it also acts as a settling chamber and much material may be precipitated there, and the exit velocity to the final filter or fan may be appreciably reduced, since the high conveying is not needed at the outlet. Several types of plenum chambers are described and illustrated. In one type the plenum is located below the machines it serves, so low that the material caught can slide by gravity into the plenum, necessitating no more than the most meagre branch velocity, effecting savings in power and maintenance. In another, the grinders or other machines are built into the plenum chamber or at least attached to it, so that no contraction in cross-sectional area of the hood occurs, and the material slides by gravity into the plenum, thus avoiding any conveying velocity. This system requires a conveyor for removal of the precipitated material and a storage tank. When it is not necessary to avoid outside air contamination, a plenum with sufficiently large cross section is equipped with a tall tapering evase stack instead of a filter with a resultant overall loss of less than 1 inch water gauge. The author stresses the great benefit to be derived from a study of the science of dust control by the company's own engineers.

587 Dust Control in the Air Conditioned Room. F.F. Kravath. Heat. & Vent., 38, 36-39 (May, 1941).
The author describes methods of cleaning air from dusty operations, and recommends recirculation of air from exhaust systems wherever considerations of economy make it desirable. The savings from such installations are estimated, and maintenance of the system is described.

588 Air Sterilization by Sodium Hypochlorite. Anonymous. Review of article in Heating and Ventilating Engineer, London, reference not given. Heat. & Vent., 38, 33 (May, 1941).
Sodium hypochlorite is used in London for sterilizing air in air raid shelters, moving picture houses, public buildings and factories. The solution decomposes when exposed to air, liberating hypochlorous acid gas. The minimum irritant dose is much higher than the minimum lethal dose for bacteria, and so it is particularly adapted for air sterilization. It is stated that a reduction of 99% in the bacterial count of an inhabited room has been obtained by 1 volume of the gas in 5,300,000,000 parts of air. Hand spraying the 1% solution has been found to give results in small air raid shelters. Power sprays are used in larger spaces. In air conditioning systems it has been found possible to install a vaporizer in a direct intake supply in such a manner as to insure an automatic supply of the correct proportion of hypochlorous acid. The presence of caustic soda in the hypochlorite solution is objectionable.

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589 Air Dilution in Industrial Ventilation. III. W.C.L. Hemeon. Heat. & Vent., 38, 40-2 (February, 1941).
In this installment the author first considers local exhaust vs. dilution ventilation. In general, where pneumoconiosis-producing dusts, lead fumes and dust, mercury, chlorinated naphthalenes and similar materials are present, only local exhaust systems can be used. Exceptions occur in situations of temporary large scale contamination, as in foundries during dumping of castings and conditioning of sand, and then only if the processes are of relatively short duration and the volume of ventilation is generous. Air distribution is next discussed. It is shown that in rooms with the same openings, it is immaterial whether a blower, an exhaust fan or both, with the same capacity, are used. The air entering a room tends to blow in a straight line, and the leaving air currents follow the law of local exhaust hoods, whichever method is used. Air entrainment around positive air streams, localized dilution and objectionable drafts are also considered.

590 Air Dilution in Industrial Ventilation. IV. W.C.L. Hemeon. Heat. & Vent., 38, 71-4 (March, 1941).
The preceding papers in this series have been summarized in Abstracts No. 20 and 22, January, 1941, and No. 589, this Bulletin. In the concluding installment the effect of room dimensions is discussed. Spacious arrangements of processes and high posted rooms, are frequently cited as safeguards against room air being contaminated. The author's full analysis of the various factors shows that they are not all favorable to use of the larger room. The factors considered in connection with choice or room size include natural ventilation, build up rate, and continuous and discontinuous contamination. Floor ventilation for heavy vapors is also discussed, with attention to the fallacy of the belief that substances of high molecular weight sink rapidly to the floor and can be more easily removed near the floor. A table shows that concentrations of various fairly heavy vapors are not significantly higher at the floor than at breathing level. Downdraft ventilation is an excellent arrangement in most cases but can be treated only as a local exhaust or as part of a general system of ventilation. The author finally considers the effect of slight differences in densities of air streams due to temperatures differentials, a very important factor in the design of air distributing systems. Such differences play a much greater part in ventilation than the differences in densities of contaminants and air which are due to their molecular weight.

Papers on Industrial Poisons, Cancer, Dermatitis, etc.

591 Elimination in the Urine of Cobalt Administered Orally to Man. F. Penati and R. Ruata. Rass. Med. Ind., 11, 372-80 (1940). (Italian).
Seven normal subjects ingested daily for 3-4 days 0.25 g. finely pulverized metallic cobalt. No severe disturbance followed. Cobalt, determined in the urine by a spectrophotometric method, rose rather rapidly from the second to the fourth day, then fell more slowly. The percentage eliminated varied from 1 to 6, with a mean of 3.38%.

592 Injuries from Acridin among Coal Workers. W. Leopoldsberger. Wien. klin. Wchnschr. 53, 1076-7 (1940). (German).
Fourteen workers engaged in unloading briquets were found to have dermatitis and conjunctivitis of every degree, also lesions of the cornea which caused loss of the epithelium and, in the most severe case, nearly the entire cornea. The author's opinion, based upon chemical examination, is that the damage is due to acridin.

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593 Dermatitis from Butane or Butane Gasoline. Queries and Minor Notes. J. Am. Med. Assoc., 116, 2450 (May 24, 1941).
The inquirer reports a case of irritation of the skin of the entire body following spraying of "butane gas" on the arm, and requests information on the composition and toxicity of the gas. It is not clear whether the material in question is butane itself or "butane gaoline" which is a natural gasoline or casing-head naphtha, high in butane and other low-boiling hydrocarbons. The reply briefly presents the physical properties of butane and the toxic effects of low-boiling hydrocarbons. Butane is likely to have a powerful irritating effect on the skin because it is a strong fat solvent and because its evaporation freezes the skin. The eruption would consist of erythema with pustules, vesicles and ulcers. Natural gasoline has the same effect in a slighter degree and is more irritating than ordinary gasoline. The patient not only suffered a dermatitis from the primary irritating effect of the gasoline but also became sensitized, so that other portions of his body, on which minute portions of the gasoline may have fallen, become seats of allergic dermatitis.

594 Ocular Burns by Lime. A.T. Estrada. Bol. del Hosp. Oft. de Ntra. Sra. de la Luz 1, 125-8 (1940). (Spanish).
In order to neutralize the particles of lime included within coagulated tissues, the author uses a solution of sugar, which readily combines with the lime to form an easily soluble calcium saccharide. The most effective method consists in applying powdered sugar within the conjunctival sac, preferably under local anesthesia. After irrigation a weaker solution is applied, frequently for 2 or 3 days. Burns produced by the juice of the maguey plant, in workers engaged in extracting the fiber, are probably due to precipitation of needles of calcium oxalate in the tissues, and the same treatment is effective.

595 Methods of Determining Arsenic in Hair and Nails. O. Szep. Ztschr. f. physiol. Chem. 267, 29-56 (1941).
The author tabulates the data in the literature concerning the normal arsenic content of hair and nails. The values vary so widely as to raise doubt as to the accuracy of many of the determinations. The author found 24-77 gamma % in normal hair and 150-520 gamma % in normal nails. A man with arsenical polyneuritis had 694 gamma % in the hair and 1905 and 4500 gamma % respectively, in finger and toe nails. The author stresses the necessity of cleaning the hair and nails thoroughly before examination. The method of Bodnar and others (Abstract No. 684, September, 1940) was used with a modification by which heated hydrochloric acid destroys the material more rapidly.

596 The Influence of the Titration Alkalinity of Cleansing Agents on the pH Value of the Human Skin. L. Peukert. Arch. f. Dermat. u. Syph. 181, 417-24 (1940).
The soaps generally used destroy the natural acid production of the skin, and the alkalinity thus produced leads to skin diseases. The author shows that the destructive action is measurable by the titration alkalinity rather than by the actual alkalinity. A harmless cleansing agent is very important, especially for workers in dirty occupations, and so long as alkaline soaps are necessary, only those should be used in which the titration alkalinity is not too high.

597 Dermatitis Due to Dextrins Used as an Adhesive on Tax Stamps. J.D.Walters and E.C. Stern. J. Am. Med. Assoc., 116, 1518 (April 5, 1941).
The authors report two cases of dermatitis caused by dextrins used in adhesives on stamps pasted on cigarette packages. The fingers on both hands show moderate fissuring, crusting and induration. Papules with excoriation and crusting may also be present. Removal from the occupation allows healing of the lesions. Patch tests gave positive results. Long sleeved garments and frequent washing are recommended as preventive measures.

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598 Treatment for Cyanide Poisoning. Queries and Minor Notes. J. Am. Med. Assoc., 116, 2640 (June 7, 1941).
The inquiry concerns the status of treatment of cyanide poisoning with sodium nitrite and sodium thiosulfate, intravenously, and methods of preparation of the materials. The mixture of drugs, tested on dogs, was found to detoxify 20 minimum lethal doses of sodium cyanide and to be 10 times as effective as methylene blue. The work of several investigators is reviewed briefly. Chen suggested immediate and repeated inhalation of amyl until the injections of the above salts are begun. Etteldorf found that injections of the drugs before exposure to hydrogen cyanide vapors gave protection against concentrations 4 to 6 times as great as would produce convulsions in control dogs. Methods of preparing the drugs for sterile administration are given.

599 Hepatic and Renal Changes in Beryllium Poisoning. A Contribution to the Study of the Toxic Hepatonephritides. S. Caccuri. Rass. Med. Ind., 11, 307-14 (1940). (Italian).
The effects of beryllium carbonate, nitrate and oxide on the liver and kidney in rabbits were studied. In the case of each compound, daily injections of 1 mg. per kg. body weight were made in 3 animals, which were then sacrificed after 30, 60 and 90 days, respectively. Congestion and degenerative changes were observed, and in rare cases, slight proliferation of the connective tissue. Of the 3 compounds, the nitrate caused the greatest injury.

600 A Method of Determining the Resistance of the Skin in Occupational Dermatoses by the Use of a Chemical Indicator. C. Betti. Rass. Med. Ind., 11, 203-18 (1940). (Italian).
Using Burckhardt's method, which he describes, the author tested 104 painters, 66 of whom were healthy, 18 suffering from dermatoses, and 20 controls not exposed to toxic substances. The ability of the skin to neutralize alkaline substances varies among healthy individuals but is practically always definitely diminished in persons who have occupational dermatoses.

601 Diagnosis and Treatment of Arsenic Poisoning. G. Rodenacker. Med. Klin., 36, 1080-2 (1940). (German).
The author mentions perforation of the septum in arsenic workers, and describes acute and chronic arsenic poisoning and its treatment, recommending especially sodium thiosulfate. He attributes cirrhosis of the liver to the combined effects of arsenic and alcohol, and considers arsenic eating as a cause of cancer. The latter points are quite controversial.

602 Rhinopharyngeal Disturbances Among Cadmium Workers. G. Mancioli. Rass. med. Ind., 11, 632-9 (1940). (Italian).
The author describes ulcerations of the cartilaginous portion of the nasal septum and inflammation of the nose and pharynx among workers employed in electroplating with cadmium. He attributes the disorders to cadmium absorbed by the body. No case of perforation of the septum was found.

603 Dermatitis in Fruit Handlers. Queries and Minor Notes. J. Am. Med. Assoc., 116, 87 (January 4, 1941).
The question concerns prevention and treatment of dermatitis arising from handling apples continuously. Dermatitis is quite common among fruit handlers, and is apparently caused by maceration of the skin and irritating action of the juices. Rubber gloves and impervious sleeves and aprons are recommended. Mild lotions or ointments are advised, with cessation of work in severe cases. The inquirer is referred to Public Health Bulletin No. 249, page 9 and to other references.

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604 Line Coordinate Chart for Vapor Pressures of Organic Solvents. D.S. Davis. Ind and Eng. Chem., 33, 401 (March, 1941).
A line coordinate chart is given for determining the vapor pressures of n-amyl and n-butyl acetates, diacetone alcohol, diisobutylene, ethylene glycol monoethyl ether, isodecane and isooctane, over a temperature range of 0 to 180°C.

605 Dermatitis Due to Parachlormetacresol. W.H. Guy and F.M. Jacob. J. Am. Med. Assoc., 116, 2258 (May 17, 1941).
Twelve cases of vesicular dermatitis, mostly in the palm of the left hand of girls employed in labeling and capping whiskey bottles, were traced to a preservative fluid in which the viscose caps were shipped to the distillery. The shipping fluid was reported to contain 1 to 1.5% of parachlormetacresol, and patch tests with a similar solution of parachlormetacresol gave positive results. Washing the caps in water before handling prevented the appearance of new cases.

606 Hazards of Degreasing Agent. Queries & Minor Notes. J. Am. Med. Assoc., 116, 2354 (May 17, 1941).
Symptoms of a patient exposed to a commercial degreasing agent consisting of a chlorinated hydrocarbon correspond to those of acute effects of such solvents. In acute poisoning, evidences of severe gastrointestinal irritation, hapatitis and possibly nephritis may arise. No work should be performed in vapors of this cleansing agent when the concentration exceeds 200 parts per million of air throughout the shift period, although 1,000 parts per million are not known to be dangerous for short exposures, such as one-half hour. Protection is customarily afforded by the use of tanks with water jackets which condense the vapors at a level below the top of the tank. Otherwise, protection may be procured through the installation of appropriate exhaust systems.

607 Problem of Control of Mercurialism in the Manufacture of Felt Hats. S.H.Osborn. Connecticut Health Bull., 55, 155-6 (June, 1941).
The author outlines the history of the use of mercury in carroting felt hats, the development of mercurial poisoning in felt hat workers, and the long but finally successful search for a substitute for mercury. As announced in Abstract No. 420, June, 1941, Bulletin, the industry has agreed to eliminate the use of mercury compounds. The proposed state regulations governing the use of hatters mercurial carroting solutions, adopted by the conference in Washington on May 19, 1941, are presented. Section 1 defines hatter's fur, carroting and mercurial carrot. Section 2 states that effective December, 1941, the use of mercurial carrot in the preparation of hatter's fur, or the use of mercurial carroted hatters' fur in the manufacture of hats, is prohibited, provided that stocks of mercurial carroted fur on hand on that date may be used until consumed.

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