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.

V. 1. 2. May, 1940 No. 5

Companies Interested in Sick Absenteeism to meet May 27

An "instruction" meeting of companies participating in the Foundation's survey of "Sick Absenteeism in Industry," and companies desiring more information about the survey, will be held at Mellon Institute, Pittsburgh, on May 27 at 10 A.M. Eastern Daylight Time. Notices of the meeting have been rushed to all companies affiliated with the Foundation.

The purpose of the meeting is to explain how to keep tabs on workdays lost through illness, and to answer questions companies may have respecting the work. Such subjects as forms for recording absences, amount of clerical work involved, expense, confidential character of the material, benefits of such an "inventory" to management, etc., will be explained by the following specialists:

Dr. A.J. Lanza,	Chairman, Foundation's Medical Committee
Dr. R.R. Sayers,	Representing Public Health Service and Association of Industrial Physicians and Surgeons
Dr. C.D. Selby,	Medical Consultant, General Motors Corporation
Dr. W.M. Gafafer,	Senior Statistician, Public Health Service
Mr. R.J. Vane,	Statistician, Metropolitan Life Insurance Company

Dr. Lanza will outline the subject. Dr. Sayers will explain the collaboration of the Public Health Service. Dr. Gafafer and Mr. Vane will explain the technical details, the "do's" and "don'ts." Dr. Selby will speak from the experience of a company engaged in such a survey.

The above authorities on the subject of sick absenteeism met at Mellon Institute on May 3 and planned details of the survey as well as the program for the May 27th meeting. All companies interested in this vital work should be represented at the "instruction" meeting.

Foundation's Work Summarized in Mellon Institute Report

Enclosed with this monthly Digest is a copy of Mellon Institute's Annual report, just released. Please see the special section, starting on page 296 devoted to the work of the Foundation during the Institute's fiscal year.

James J. Donny, 55, noted Canadian metallurgist who worked with Dr. W. D. Robson in experiments with aluminum dust as a possible silicosis preventive, died at Toronto on April 30, according to the Associated Press.

Members of the Foundation staff have articles in the current issues of the NATIONAL SAFETY NEWS and SCIENTIFIC AMERICAN.

F 130542 .....Pennies for prevention save dollars worth of cure.....

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

DIGEST OF INDUSTRIAL HYGIENE
Literature--News--Developments

News Items

350 Legislation Relating to Compensation for Partial Disability from Silicosis.
T. C. Waters, member of the Foundation's Legal Committee (Mullikin, Stockbridge and Waters, Baltimore, Md.) gives the following summary regarding states which do not grant compensation for partial disability from silicosis:

1. Arkansas. This law does not become effective until approved by referendum to be held November 5, 1940. No compensation payable for disability from silicosis or asbestosis of less than 33-1/3% of total disability. (Enacted 1939).
2. Idaho. No compensation for partial disability from silicosis. (Enacted 1939).
3. Maryland. No compensation for partial disability from silicosis or asbestosis. (Enacted 1939).
4. Massachusetts. No compensation for partial incapacity due to silicosis or other occupational pulmonary dust disease. (Laws of 1939).
5. Michigan. No compensation for partial disability due to silicosis or other dust disease. (Act of 1937).
6. New York. No compensation for partial disability due to silicosis or other dust disease. (Act of 1940).
7. Ohio. Compensation payable only on account of silicosis in the event of temporary total disability, permanent total disability or death. (Act of 1939).
8. Pennsylvania. No compensation for partial disability due to silicosis, anthraco-silicosis or asbestosis. (Enacted 1939).

351 American Industrial Hygiene Association, First Annual Meeting, Hotel Pennsylvania, New York City, June 4-5, 1940.
This group meets jointly with the American Association of Industrial Physicians and Surgeons who hold their 25th annual meeting this year. Pertinent material presented will be abstracted in future issues of this Digest.

352 Over-Heating and Over-Exertion Results in Death of Boiler Fireman. Occupational Hazards, 2, 36 (April, 1940).
Compensation was sought for the death of a boiler fireman. The employee who had heart trouble, hardening of the arteries and high blood pressure died suddenly, shortly after he finished shoveling fuel into the furnace. It was shown that a great deal of heat was thrown off from the open furnaces, and that under the conditions the job of keeping the furnaces going was quite exhausting. The Court said that the death of the fireman was compensable as resulting from an "accident"; that the facts and circumstances surrounding the death lead to the conclusion that the death was hastened by the over-heating and over-exertion arising directly from performing duties in connection with his employment. To say that the deceased, in his condition, might have died suddenly at home or in any other place is merely entering the field of speculation. Ozbolt vs. Weber-King Manufacturing Co., et al. (Louisiana), 193 S. 383 (Jan., 1940).

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353 Employee's Negligence and Violation of Company Rule Doesn't Prevent Award. Occupational Hazards, 2, 37 (April, 1940).
A packing house employee suffering an attack of indigestion went to an adjoining pickling room to get a drink of water. In that room he noticed a barrel containing a substance which looked like, and which he thought to be baking soda. The barrel was painted red to denote danger, and labeled "sodium nitrate." The employee dissolved some of the substance in water, drank it, and became fatally ill.
The Company resisted a claim for compensation on the ground that the death did not arise in the course of employment; that the death was caused by an act of self-medication in violation of a company rule requiring ailing employees to report to the company hospital. The Court granted an award to the widow and children of the deceased employee. It said, "Acts essential to life, comfort, and convenience of employees while at work are incidental to his service, and injuries sustained in their performance 'arise out of the employment' and are compensable. The violation of the rule governing employeesdid not remove the employee from the course of his employment." There was no question but that the employee in this case was negligent, but the Court said that negligence of an employee is not a factor in a workmen's compensation case. Security Mutual Casualty Co. vs. Wakefield (U.S. Cir. Ct. of App., 5th Cir.) (Texas), 108 Fed. (2nd) 273 (Jan., 1940).

354 High Court Speaks on Impartial Physicians. Labor Standards, U.S. Dept. of Labor, 3, 26 (March, 1940).
Workmen's compensation administrators are often confronted with conflicting medical testimony as to the nature and extent of disability and its relation to trauma or employment exposure. In such cases the usual procedure is the selection of an impartial physician to examine the claimant and pass an opinion upon the disputed facts. Because this opinion is often accepted by the administrators as final and conclusive, the role of "impartial examiner" is highly important. The question arises whether a physician who is professionally employed more or less frequently by insurance carriers can be termed "impartial" from the viewpoint of the workmen's compensation claimant. This question was recently presented to the Supreme Judicial Court of Massachusetts by a compensation claimant in that State. It is thought to be the first case of this kind passed upon by a high court. In an opinion handed down this month the court held that "it cannot be ruled as a matter of law that a physician is not impartial because merely he has testified in numerous cases on behalf of insurance companies." The court indicated, however, that a different question would arise if the physician had been "habitually employed or consulted by this employee or this insurer in respect to other than the injury here involved." While thus ruling on the precise question of law, the Massachusetts opinion, however, contains this comment: "We agree with the argument of the employee that it is the duty of the board to exercise all possible care to appoint as impartial physicians under the act only such as are really impartial, and that every effort should be made to avoid the appearance as well as the fact of favoritism or sympathetic inclination towards one party as against the other."

355 Blood Clot a Compensable Injury in Georgia. U.S. Dept. of Labor, Monthly Labor Review, 50, 671 (March, 1940).
The Georgia Court of Appeals recently upheld a decision of a lower court which allowed compensation to an employee for a blood clot caused by jarring in the operation of a gas shovel. The employee operated a gas shovel weighing 17 or 18 tons, and was obliged to sit in a cramped position. The constant jarring and jolting resulted in the formation of blood clots in both legs, causing severe pain and disabling him for work. The industrial board ruled that the employee's condition resulted from an occupational disease and therefore was not compensable

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under the State workmen's compensation act. The lower court reversed this finding. The Court of Appeals, in affirming the decision of the lower court, was of the opinion that the industrial board erred in finding that the blood clot, technically called phlebitis, was an occupational disease. Any injury, the court said, resulting from a sudden jarring, such as the shovel caused, was an injury compensable under the workmen's compensation act. (Lumbermen's Mutual Casualty Co. et al. v. Layfield, 5 S.E. (2d) 610.)

356 Unemployment Benefits No Bar to Workmen's Compensation. U.S. Dept. of Labor, Monthly Labor Review, 50, 670 (March, 1940).
An employee receiving unemployment benefits under the unemployment compensation act is not disqualified from recovering compensation for the same period under the workmen's compensation act, according to the Supreme Court of Michigan. This was held in two recent decisions. The court ruled that in both instances the awards were statutory, and, although there was no doubt as to some inconsistency in the provisions, they were bound by the wording of the acts. The employee, in the first case, suffered from an injury which necessitated the amputation of part of a finger and prevented him from continuing in the same line of work. He was, however, given a job as a sweeper, and was so employed when he was laid off. The second case concerned an employee who had sustained a hernia and, for a short period, was paid compensation for total disability. He thereafter returned to work and was working full time when laid off. The employee, in each case, obtained unemployment benefits, and later applied for and received an award of workmen's compensation for the same period. Both men were employed by the Ford Motor Co., which claimed a deduction of this award during the period the employee was paid unemployment benefits. In upholding the award of workmen's compensation, the court pointed out that there was nothing in the unemployment-compensation act which precluded the employees from recovering under the workmen's compensation act, and vice versa. The legislature, it was said, intended to create two independent organizations to administer two kinds of compensation, payable from different funds, and until the enactment of the unemployment-compensation act there would have been no dispute as to the employees' right to compensation. It was also observed that members of the Michigan Unemployment Compensation Commission and the agency administering the workmen's compensation act are public officers, and that they may not refuse compensation to persons entitled to it under the act. In this connection, the court declared that if a deduction of the award was permitted the court would be granting relief beyond the terms of the workmen's compensation act, and, for these reasons, concluded that the remedy to provide for deductions or for denial of compensation under either act is with the legislature. (Henry v. Ford Motor Co., 289 N.W. 244; Bartels v. Ford Motor Co., 289 N.W. 322.)

357 General Session on Toxicology. American Ceramic Society, Toronto, Canada, April 7-13, 1940.
Pathological Influence of Dusts in the Ceramic Industry. Dudley Irwin. -- An explanation of the function of the lung and how the presence of dust interferes with its normal function. Toxicity of various kinds of dusts, the ways of determining the amount and toxicity of dusts encountered in industry, and methods that may be applied to prevent the development of silicosis are discussed.
Relative Toxicity of Lead and Some of Its Common Compounds. Lawrence T. Fairhall. An investigation was made of the relative toxicity of lead and various lead compounds, commonly encountered (including lead arsenate, lead carbonate, lead chromate, litharge, red lead, lead peroxide, lead phosphate, lead silicate, lead sulfate and lead sulfide) following the administration of these substances by mouth, by intraperitoneal injection, and by inhalation. Symptoms of lead poisoning, such as muscular incoordination and anemia were sought; blood changes with respect to the red cells, particularly basophilic stippling, polychromasia, and

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morphologic changes were noted; and blood calcium determinations were made. Body weight changes and mortality figures were collected. The lead was administered in known amounts by ingestion, injection, and inhalation, and its distribution in such tissues as the liver, kidney, bones, lungs, and carcass was determined after such exposure. The toxic effect of lead compounds was more evident on inhalation than when administered either by mouth or by intraperitoneal injection and emphasizes the importance of this type of exposure in dusty trades employing lead. The order of toxicity as shown by feeding experiments did not vary much for a number of the compounds studied. Lead carbonate, lead monoxide, and lead sulfate, however, were shown to be more toxic by mouth than metallic lead or the remaining lead compounds. Lead carbonate and lead monoxide were more toxic following inhalation than the other compounds studied.

Health of Brick and Tile Plant Workers in North Carolina. M.F. Trice. -- This paper reviews some of the data obtained in an investigation of the North Carolina brick and tile industry to evaluate the siliceous dust exposure of the workers in terms of hazards to health, particularly with respect to silicosis. The distribution of the 48 plants is shown by map and classified as to raw material employed, i.e., alluvial clay or shale. Plant equipment and operating practices are reviewed in a general discussion of the industry. The extent of the dust exposure of the workers by occupational classification is appraised in terms of millions of particles of dust per cubic foot of air, which is based on particle-count analyses of 183 samples of air-borne dust collected in 28 plants. An evaluation of the health status of the workers is based on medical data obtained in the clinical and x-ray examination of 1550 employees in an equal number of plants, most of which were the same as those in which dust samples were obtained. There is presented an analysis of the more important medical data. The investigation disclosed that none of the employees had silicosis, a fact which apparently is explained by a low quartz content of the atmospheric dust, an absence of excessive concentrations of dust, and a high labor turnover.

Engineering Control of Dust with Special Reference to Respirators. A.D. Brandt. A brief discussion of the more common methods of reducing or controlling the respiratory hazard due to dust. Specific methods named are (1) control of dust at point of generation; (2) isolation of dusty processes; (3) process changes; and (4) reduction of dust in inspired air by means of respiratory protective devices. The general methods are (1) general ventilation, (2) good housekeeping, and (3) a rigid inspection of all control devices. The remainder of the paper is devoted to a detailed discussion of respirators, their proper use, construction, maintenance, and Bureau of Mines approval.

358 List of Respiratory Protective Devices Approved by the Bureau of Mines. H. H. Schrenk, U.S. Bur. of Mines, Inf. Circ. No. 7030 (Fifth Supplement) (April 18, 1940). See No. 792, November 1939 (Digest of Industrial Hygiene) for previous approvals.

SCHEDULE 14D--GAS MASKS.

Type A.--Acid Gas Masks.

4. Davis Hydrocyanic Acid Gas Mask. Approval BM-1424, issued to Davis Emergency Equipment Co., Inc., December 11, 1939.
5. Willson Chlorine Gas Mask. Approval BM-1426, issued to Willson Products, Inc., March 8, 1940.

Type C.--Ammonia Gas Masks.

9. Willson Ammonia Gas Mask. Approval BM-1425, issued to Willson Products, Inc., December 20, 1939.

SCHEDULE 21 --MECHANICAL-FILTER RESPIRATORS.

Type A.--Pneumoconiosis-Producing or Nuisance Dusts.

22. M.S.A. Alkali Dust Respirator. Approval BM-2136, issued to Mine Safety Appliances Co., December 1, 1939.
23. American Optical Co., R9100 Respirator. Approval BM-2137, issued to American Optical Co., March 6, 1940.

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SCHEDULE 21 --MECHANICAL-FILTER RESPIRATORS CONT'D.

Lead Dust.

7. American Optical Co., R1000T Respirator. Approval BM-2138, issued to American Optical Co., March 16, 1940.

Type B.--Fumes

2. M.S.A. Comfo Respirator. Approval BM-2139, issued to Mine Safety Appliances Co., March 27, 1940.

Notices of New Books

359 Dermatologic Allergy by M.B. Sulzberger, M.D., 540 pp. $8.50. Charles C. Thomas, Baltimore, Md.

This book is a compilation of lectures given by the author and is "intended to be only a primer, an 'Introduction' to Dermatologic Allergy." The titles of the Chapters are as follows: I. On Definitions and Classifications. II. On the Skin as a Protective Organ; the Skin as the Recorder and as the Possible Originator of Allergic Changes. III. On Some Fundamental Phenomena of Allergy and Their Significance as the Common, Basic Factors in Certain Diseases and Reactions Due Either to Non-living Allergens or to the Agents of Infectious Diseases. IV. On the Investigation of Individual Cases Presumed to be Based on Allergy. V. On Common Allergic Skin Reactions and Skin Diseases: Their Classification and Some of Their Distinctive Characteristics. VI. On Eczematous Contact-Type Dermatitis (Dermatitis Eczematosa or Eczema); Significance, Differential Diagnosis and Etiologic Investigation. VII. On Urticarial Responses to Skin Tests. On Urticarial Skin Diseases, Including Atopic Dermatitis. VIII. On Some Manifestations of Allergy in Infectious Diseases. IX. On Allergy to Tuberculin and on Tuberculoderms--Including the Sarcoid Group. X. On Allergy to Fungi (Dermatomycetes) and to the Fungous Extracts (Trichophytin); on Dermatomycoses. XI. On Allergy as the Basis of the Manifestations of Cutaneous Syphilis--(Including Specific, Acquired "Chancre Immunity"). XII. On Allergy and Allergic Skin Reactions in Miscellaneous Infections; and in Other Exposures to Living Agents and Their Products (Parasitic Infestations, Insect Bites, etc.; Foreign Sera, etc.). XIII. On Allergy to Drugs and on Drug Eruptions. XIV. On the Future of Allergy. There are several appendices, one of which is a tabular presentation of criteria for determining the industrial character of a dermatitis.

Papers on Air, Dust and General Industrial Hygiene

360 Analysis of Occupational Disease Claims Filed During Year 1939. Ohio Ind. Comm. Monitor, 13, 55 (April, 1940).

A preliminary summary shows a marked increase over the preceding year from 1,358 to 1,713. This seems to be due largely to an unusual number of claims for skin disease. Many of those are largely preventable. Lead poisoning claims slightly increased but showed less than 1937. Prepatellar bursitis and tenosynovitis increased as did claims for poisonings other than lead, such as benzol, arsenic, mercury, manganese, anilin, sulfur dioxide and volatile petroleum products. There were 160 claims for silicosis, of which 40 were complicated by tuberculosis. The foundry industry had 53.1% of the claims and the ceramic industry 37.9%. In every case where cases of silicosis developed it was found that high dust counts developed. During the past year the occupational disease law was amended to include all occupational diseases. The definition given is: "A disease peculiar to a particular industrial process, trade or occupation and to which an employee is not ordinarily subjected or exposed outside of or away from his employment."

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361 Analysis of Silicosis Claims. Ohio Ind. Comm. Monitor, 13, 56 (April, 1940). Since the amendment adding silicosis to the list of compensable occupational diseases became effective July 31, 1937, a total of 337 claims based upon silicosis have been filed with the Industrial Commission of Ohio. Approval was given to 131 claims, 190 were disallowed and 66 are still pending. Up to March 29, 1940, the cases allowed were distributed as follows: Foundries 67, of which 16 were in steel foundries, 35 in iron foundries and 16 in non-ferrous foundries. This is 51.2 per cent of the claims filed. In the ceramics industry there were 52 cases, or 39.7 per cent of the total. They were distributed as follows: Building brick and tile 1, enamels 2, firebrick 1, floor and wall tile 11, glass house refractories 8, insulating brick 3, insulators 4, silica brick 1, silica sand and diatomaceous earth 2, stonewear products 2 and tableware 17. In cut stone work there were 8, or 6.1 per cent, 6 being in monument work, 1 in quarries and 1 in building. Polishing, buffing and grinding accounted for 3, or 2.3 per cent of the total and coal mining 1, or .7 per cent. During the month of March, 5 claims were allowed and 9 disallowed.

362 Limitations of Compensation Insurance. L.T. Parker. Pit and Quarry, 2, 49 (April, 1940).
The original intent of workmen's state compensation laws was to assure employees of reasonable compensation for disabilities, and to enable employers to secure protection against expensive damage suits by employees; in other words, to eliminate the necessity of suing for damages. Generally speaking, of course, an employer who provides state compensation insurance cannot be sued by an injured employee for damages. Nevertheless thousands of employers who pay premiums for state industrial and compensation insurance are often astonished when awards for damages amounting to thousands of dollars are made to injured employees. The laws of Pennsylvania and many other states do not provide compensation for illness arising from occupational disease, unless it results from violence. In this connection, a higher court has rendered a leading decision in the case of Billo v. Allegheny, 195 Atl. 110. The facts of this case are that a worker was employed in a grinding department using emery wheels for a period of five years, when he became ill and incapacitated. No exhaust-fans were supplied to draw off the dust. After a time the employee offered testimony to prove that he had contracted silicosis. Since the laws of the state do not provide for compensation to employees who contract occupational diseases, the employee sued for damages, alleging negligence of the employer in failing to supply: (1) adequate exhaust fans to carry off the dust, and (2) sufficient ventilation--all which were required by state laws. The lower court held the employer liable in the amount of $6,000. On appeal, the higher court declared: It is well settled that an employee has a common-law right of action against his employer for injuries caused by disease contracted by the employee in the course of his employment and due to the negligent conduct of the employer in violation of a statutory duty.

Under certain circumstances an injured employee may be unable to collect insurance benefits from the state and may sue the employer for damages. For illustration, in the leading case of Hamilton v. J. Le Roy Company, 261 N.W. 506, it was disclosed that a Mr. Hamilton acted as manager of a plant while it was in operation, but during off-seasons he performed various kinds of manual labor around the plant. One day Hamilton was seriously injured while engaged in taking an inventory of stock located in the warehouse of the factory. The owner of the plant quite naturally expected that Hamilton should be paid compensation insurance for the injury and that he could not sue for damages. However, the Industrial Commission refused to approve Hamilton's compensation claim on the grounds that he was not an employee protected by the compensation insurance laws because at certain periods he acted as a representative or manager of the plant. As a result, Hamilton brought suit against the company for damages. The laws of certain states provide that employers who post notices, supplied by the

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commission, stating that they carry insurance, shall not be sued by injured employees, or their dependents for damages. If the employer forgets to post these notices in conspicuous places, or the industrial commission neglects to send the notices, the employee may sue for damages. Another portion of the law provides that all employers who have paid insurance premiums may be sued by employees who are injured because the employer failed to comply with "lawful requirements for the protection of the lives and safety of employees." In a leading case (91 O.S. 205) it was held that if an employer fails to place a guard on a mechanical apparatus, the employee may sue instead of accepting compensation.

363 Proceedings of the Sixth National Conference on Labor Legislation. U.S. Dept. of Labor, Div. of Labor Standards Bulletin No. 35, 109 pp. (1940).
In these Proceedings, the Report of the Committee on Prevention and Compensation of Industrial Injuries and Diseases is of most interest here. The Committee recommends: that compulsory compensation for all industrial injuries; that insurance should be in an exclusive State Fund; that "injury" should be defined to include occupational disease and coverage should be "blanket" instead of by schedule; that medical and hospital service should be unlimited; and that power should be vested in labor departments or industrial commissions to establish minimum standards of safety and health by the promulgation of industrial health and safety codes. The Committee approved a resolution petitioning that Senate Bill 1620 (Wagner National Health Bill)include provisions making it possible for State labor departments to obtain funds for the furtherance and promotion and control of industrial hygiene, and that labor departments have an equal opportunity with departments of health to secure such funds. These are only highlights of the Report. Copies may be obtained from the Government Printing Office, Washington, D. C.

364 Guarding the Health of Garment Workers. L. Price. Lab. Inform. Bull., 7, 6-7 (January, 1940).
In 1913, the International Ladies' Garment Workers Union established its Union Health Center in New York to promote the health of its members and their families. Prospective members must pass a physical examination. Those with physical defects or who are over 50 are taken in as "non-beneficiary" members. No one with acute or contagious disease is accepted. Up to 1920 an average of 3000 examinations had been given; in 1939 the estimated number is 95,000. Several of the locals of the union have sick benefit associations with premiums ranging from $1.00 to $6.80 per year. Some provide care for tuberculous members and one offers hospital insurance. All members pay $1,00 a year, entitling their beneficiaries to $150 death benefit.

365 Disabling Morbidity Among Industrial Workers, Final Quarter of 1939 and the Entire Year. W.M. Gafafer. U.S. Public Health Reports, 55, 650-652 (April 12, 1940).
These statistics are based on periodic reports on sickness and non-industrial injuries lasting more than one week among 170,000 male members of industrial sick benefit organizations. The frequency (annual number of cases lasting 8 days or longer) of 88.8 per 1000 men was slightly larger than the corresponding frequency (82.2) for 1938. Influenza and grippe appear to be primarily responsible. The 1939 frequency for pneumonia is 30% larger than that of 1938 but only slightly in excess of the figure for 1934-38. That of 1939 is the highest recorded for the ten year period 1930-39, while that in 1933 is the lowest.

366 Pneumoconiosis from Mineral Colors. J. Hagen. Arch. f. Gewerbepath., 9, 621-633 (1939). (German).
Four men had been engaged for from 15 to 28 years in crushing mineral colors. The author found silicosis of slight to medium degree and one severe case. Analysis of the mineral colors showed up to 15% quartz, but mostly 1.5 to 2.5%.

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367 Use of Respirator Masks Ends Sickness Absences. H. M. Scherr. Factory Man. & Main., 98, 49 (April, 1940).
An examination of sick-list data revealed that 80% of the absences for illness in this plant were in the cloth-cutting department. Constant nose and throat irritation, shortness of breath, frequent coughing, and various other respiratory complaints were common among the workers in this department. Fluoroscopic examination showed a type of pneumoconiosis caused by the inhalation of wool and cotton lint given off from the fabric in cutting. The use of respirators has completely eliminated sickness absences in the cutting department.

368 Favorable Health Showing. The Management Review, p. 129 (April, 1940).
Health conditions among the 18,000 men and women employees of the main offices of the Metropolitan Life Insurance Company are so favorable that the mortality in this group is only about one-half that of the general population in the corresponding age classes, according to the statisticians of the company.
While not directly attributing this extremely low mortality to any specific cause, the statisticians nevertheless explain that for a period of more than 25 years the insurance company has made periodic medical examinations available to employees. They point out that this favorable health showing is of special interest in view of the "modern movement in favor of periodic health examinations."
In 1938 there were only 68 deaths among the group of 18,000 employees, and this figure is the equivalent of a crude death rate of 6.1 deaths per 1,000 for males and 2.5 for females, or a combined rate of approximately 4 per 1,000. These rates are only about 60 per cent of the "expected," according to the "modern Ordinary insurance experience." Making allowance for the difference in the specific sex and age composition of the employee group and of the general population, it was found that in practically every instance mortality from specific diseases among the employee group was more favorable than for the general population. The employee tuberculosis death rate, with allowance still made for difference in sex and age composition, is less than 30 per cent of the rate for the general population.

369 Silicosis--Racket or Responsibility? Ceramic Ind. 34, 41-42, 63 (April, 1940).
A general discussion of the subject of silicosis--etiology, pathology and prevention. It is generally felt that the dust hazard in the pottery industry is not serious as many of the processes are carried out in the wet state. In order to eliminate the incidence of silicosis entirely, adequate exhaust systems should be used, etc. In porcelain enameling where ware is sprayed, it is important that proper exhaust be provided and that the overspray enamel not be permitted to accumulate on the sides of the spray booth, for the enamel is highly siliceous.
In the glass industry, mixing, grinding and handling the sand are hazardous but proper protection has practically eliminated silicosis. Although several surveys have shown that cement dust is not a cause of either tuberculosis, pneumonia or silicosis, care should be taken to avoid breathing the dust. Careful physical and periodic examinations and care in the selection of personnel are advocated.

370 Roentgen Examination of the Structure of Pneumoconiotic Lungs. H. Gärtner. Arch. f. Gewerbepath., 9, 634-659 (1939). (German).
The principle of this method is the deflection of x-rays by crystals and is employed for recognizing different dusts. The author examined 15 pneumoconiotic lungs and the 6 rock dusts which caused the damage. After destruction of the lung tissue by nitric acid or hydrogen peroxide, the remaining dust was treated again, dried, and one part ashed. X-ray examination by this method permitted the nature of the dust to be determined, even if it was mixed.

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371 Prevention of Coal Dust Explosions by Rock Dusting. Mine Safety Board Decision 32. U.S. Bureau of Mines, Information Circular No. 7109, 3 pp. (March, 1940).
To prevent the propagation of mine explosions, the Bureau of Mines recommends: (1) That all coal and lignite mines, except anthracite mines shall be rock dusted. (2) That rock dust shall be distributed upon top, bottom, and sides of all underground openings of every description, to within at least 40 feet of all working faces and the areas not rock dusted shall be kept wet. (3) That rock dust shall be maintained in such quantity that the incombustible material in representative samples of dust collected shall not be less than 65 per cent. Where methane gas is present in the ventilating current, the minimum percentage of incombustible matter in the mine dust shall be increased 1 per cent for each 0.1 per cent of methane. (4) That when the rock dust in any area becomes caked so that it cannot be dispersed readily as a cloud in the air, that part of the mine shall be redusted immediately. (5) That the dust to be used shall not contain more than 5 per cent of combustible matter nor more than 25 per cent of quartz or free silica; all of the dust shall pass through a sieve having 20 meshes per linear inch and 60 per cent or more shall pass through a sieve having 200 meshes per linear inch; the dust shall not absorb moisture from the air to such an extent as to cake and destroy its effectiveness as a dry dust. (6) That rock dust barriers shall not be regarded as a substitute for generalized rock dusting. The kind of rock dust to be used should have the approval of the State Mine Inspection Service. Pure limestone or pure dolomite produces the best rock dust. If the mine personnel is repeatedly exposed to breathing high concentrations of the dust, the percentage of free and combined silica should be as low as possible, preferably less than 5 per cent. Persons engaged in the application of rock dust should wear approved dust respirators as listed in Bureau of Mines Information Circular 7030 or revisions thereof.

372 Constant Dust Feeding Device for Laboratory Use. C.E. Williams and W.P. Battista. J. Ind. Hyg. & Toxicol., 22, 152-153 (April, 1940).
A plan is presented for an inexpensive apparatus having a capacity of three pounds per minute for introducing dust into an air stream at constant rates. The machine was designed with a capacity sufficient for loading air streams up to 15-20 gr. of dust per cubic foot in a maximum air volume of approximately 1000 c.f.m. By using adapters at the hopper outlet practically all dry dusts common to industry may be fed except those which contain large chips or blocks.

373 How to Design Exhaust Hoods for Quartz-Fusing Operations. E.C. Riley and J.M. DallaValle. Heating and Ventilating, 37, 23 (April, 1940).
Because of the high temperature and fumes to which they are exposed, quartz-fusing operators must be protected by exhaust hoods. Effective removal of fumes was obtained with average air speeds of 100 f.p.m. at the face of the hood when large volumes were handled. However, to produce greater cooling effect for the operator, it is recommended that large air volumes be used at relatively low velocity (100-200 ft. per min.). The hood should be large enough to permit the fusing to be done inside and the burner should be directed into the hood.

374 The Effect of Lint on Air Filter Performance. F.B. Rowley and R.C. Jordan. Heating, Piping and Air Cond., 12, 61-67 (January, 1940).
In devising methods for rating efficiencies of commercial air filters for air conditioning, a series of studies have been made. This one employs lint. A determination of size distribution of lint taken from commercial filters was made and an artificial lint thus prepared. Ten per cent of lint in dust decreases the life of a filter more than 80%, indicating the importance of including it in artificial dust for test purposes.

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375 What's the Best Way to Remove Dust? Ceramic Ind., 34, 65-66, 68, 70, 72, 74, 76, 78 (April, 1940).
Dust control rather than dust elimination is the only practicable approach in certain manufacturing operations where the production of finely divided particles is an inherent part of the process. Of the available methods, exhaust ventilation is probably the most widely applied. The principal types of industrial dust collectors are: (1) Gravity or settling chambers -- effective only in removing relatively coarse particles, 100 to 200 microns in diameter. Used primarily to reduce dust load ahead of more effective equipment. (2) Centrifugal or cyclone chambers -- may be used for particles as small as thirty microns, although tangential cyclones will remove 5 micron particles. (3) Baffle type collector -- primarily for removal of coarse particles, it may be used at higher temperatures than those feasible with cloth filters. (4) Fan type centrifugal collector -- source of air movement together with dust removal action by centrifugal forces. (5) Wet or washer type collector -- dust precipitation by action of water spray and impingement on wetted surfaces. (6) Electrical precipitator-- due to high initial and maintenance cost, limited to higher temperature installations and where material collected is of considerable value. (7) Cloth type filter -- accomplishes high recovery of finely divided dry dusts at economical cost. Either type (tube or bag, and cloth screen) are efficient for particles of 0.5 micron. Plant atmosphere can be controlled by placing it under pressure with filtered air from outside the factory. In the pottery industry fettling of dinnerware, shaping of insulators, and sprayed glaze are sources of dust hazard. The free silica content of pottery bodies varies around 35%, therefore careful precautions must be taken to avoid dusty conditions. The vacuum cleaner is of great value here. In the glass industry the only danger lies in the handling of raw materials. Numerous methods of control are in operation for this hazard. In an enamel shop the silicosis danger is slight except, perhaps, in sandblasting operations. Dust control in spraying and brushing are desirable, however, from the standpoint of cleanliness and savings involved in reclaiming enamel.

376 Determination of Cloth Area for Industrial Air Filters. C.E. Williams, T. Hatch and L. Greenburg. Heating, Piping and Air Cond., 12, 259-263 (April, 1940).
An attempt is made to reduce the problem of determining the cloth area of industrial cloth filters to its fundamental terms. Filtering velocity is shown to have little importance per se as a criterion of filter operation and in its place emphasis is placed upon the maximum allowable filter resistance, a practical limit which is fixed at 3 in. water gage. This represents a compromise between initial filter cost and power and maintenance cost. It is well below the danger point with respect to safe filter operation for all dusts except those of extremely fine particle size, such as lamp black. For practical operation, the maximum allowable resistance must not be reached until the end of the required period of operation between cleaning periods. Thus, the basic filter specifications are (1) maximum allowable resistance and (2) minimum operating time. It is suggested that these should be specified by the purchaser of cloth filters and that the required filtering velocity be determined from the values thus fixed. The filter resistance is shown to be dependent upon several factors of which velocity of filtration is only one. Others of equal or greater importance are the particle size of the dust, the porosity of the deposit on the filter, and the loading of dust. A resistance equation is presented in which these several factors are combined in their proper form. The resistance coefficients for several industrial dusts, based upon laboratory studies, are also given. They are shown not to vary significantly among the several materials studied but to depend primarily upon the particle size of the dust. Within the range of sizes occurring in industrial exhaust systems the coefficient was found to vary many fold.

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377 Are You Buying an Exhaust System? Part III. Filters, Washers, and Precipitators. F. F. Kravath. Heating and Ventilating, October, 1939.

"Gravitational Filters: This type of filter while theoretically capable of cleaning the air of impurities down to 5 to 10 microns in diameter, nevertheless would have to be so huge that its cost and space requirements would make it prohibitive..... Where a plant is isolated from any residential or business districts, this type of filter, a slow speed planing mill exhauster and a high stack, may constitute an efficient and economical setup. Its greater use, however, is as a classifier in conjunction with a cloth or other type filter, by removing all heavier particles the life of the final cleaner is materially lengthened.....

"Cyclones: The cyclone unlike the gravitational filter increases in efficiency with a decrease in size of, at least, the diameter. Requiring but a fraction of the space of the gravity filter and capable of cleaning efficiencies which at times challenge those of the cloth filter, the cyclone is probably the most widely used dust collector..... Cyclones find their greatest use where the dust or material is non-abrasive in action. Where the dust is abrasive, cyclones may be used in conjunction with the final cleaner as a low efficiency classifier, keeping the diameter large and the inlet velocity relatively low.

"Cloth Filters: This type of filter has enjoyed the greatest popularity where high efficiencies are necessary for reclamation of valuable material, where recirculation is desired as a means of reducing heating losses, or in residential neighborhoods where it is unlawful to discharge visible solids into the atmosphere. While the cost of such a unit is considerably higher than a cyclone to handle the same volume, its efficiency is unquestioned, its life extremely long, and its maintenance quite simple as long as the proper care is given. With this type of filter it is essential that precleaning be provided to prevent tearing of the bags by high velocity large particles slipping around the baffle plates or going directly through worn baffles. Precleaning also reduces the dust loading of the air going into the filter so that the intervals between rapping periods may be materially increased without sacrificing exhaust efficiencies at the hoods.....

"Air Washers: There are many different types of air washers, scrubbers, and purifiers on the market, each of which undoubtedly has features making it preferable to different plant engineers. While some utilize the inertia of the entering dust laden air to get rid of the larger particles as by a rapid change in the direction of air flow, others have a regular cyclone built into the washer as a primary separator, its efficiency enhanced by the constantly wetted walls, which at the same time increase the life of the unit..... While it is the writer's opinion that the efficiency of the air washer is definitely lower than that of the cloth filter, when the cloth filter is properly applied and maintained--it is the lack of proper application and maintenance in so many cloth filter installations that tends to make the air washer the more practical unit. When separating coarse material, the efficiency of the air washer may approach perfection..... Points against the washer are the need of an individual pump and drive (usually the case), the cost of water when supplied from city mains, or the necessity for sludge tanks, supports, wear resistant pumps, etc., when recirculating water.....

"Electrical Precipitation: While electrical precipitation presents probably the most efficient type of separation, its initial cost is considerably higher than the washer or cloth filter due to the costly electrical equipment necessary..... As long as the cost remains high, its use will undoubtedly be restricted to the reclamation of valuable material or extremely dangerous ones, especially where recirculation is desired, but as the price is reduced this filter will be more and more widely used."

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378 Dust -- Foe of Management, Employee and Machine. Brick and Clay Record, 96, 24-28 (April, 1940).
The Medical Angle on Dust.--A brief discussion of the medical aspects of silicosis.
How You Can Determine the Amount of Dust in Your Plant. -- A short outline of the subject of dusts, dust sampling and counting with discussions of the various types of devices for the purpose.
What Some Clay Plants Have Done to Rid Themselves of Dust. -- Although the free silica content of clay is relatively small, the presence of certain quantities have been an incentive for confining clay dust and preventing its escape into the workroom. The dry pan, although one of the major dust producing units in the plant, can be effectively hooded and the dust which it generates can be completely confined. A properly designed enclosure will carry a minimum of fines from the process, and will not disturb batch ratios where various ingredients are pulverized together. Exhaust air and dust hoods are required on conveying equipment only at points of material transfer. Bucket elevators must be ventilated, and the casings enclosing them must be tight. Confinement of dust from screening equipment requires more study than any other dust producing apparatus in the usual clay plant. Necessary volumes of air exhausted here will vary with the type of enclosure provided and with the size of the screen. Grinding wheels which are used for sizing finished products should be equipped with adequate exhaust systems, in order to prevent contamination of the plant atmosphere and the subsequent detrimental effectsto men and machines. Although the prime reason for installing dust collecting systems in heavy clay products and refractories is to insure the employees a healthy working atmosphere, it has been shown that a by-product is the lower machinery maintenance costs and possible salvage of valuable materials.

379 Pneumonia in Industry. H.A. Lindberg. Ind. Med., 9, 203-205 (April, 1940).
Iron and steel workers are constantly exposed to intermittent extremes of temperature, unsheltered work, and humid and drafty conditions. The average frequency of pneumonia in occupations involving exposure to inclement weather was 13.6 cases per 1000 men. The case rate among men subjected solely to hazards involving wide ranges of temperature was 12.6 per 1000. These rates may be contrasted with the frequency of 3.9 cases annually per 1000 factory men exposed to no industrial condition which might be regarded as particularly hazardous from a pneumonia standpoint. Iron and steel workers who have recovered from pneumonia show a higher rate of heart defect than cases in a whole group of the same plant. The excess in cases of pneumonia in iron and steel over men in other industries is about 685 per year and excess deaths about 171 per year. To eliminate lowered resistance due to exposure, chilling, dampness, and temperature extremes, the worker should be constantly reminded of his general health. Seventy-five per cent of all pneumococcic pneumonias are preceded by an upper respiratory infection; therefore control of pneumonia must start here. After prevention, early diagnosis is the next important step. There are now available two powerful therapeutic agents -- anti-pneumococcic serum and sulfapyridine which are most effective when used early in the course of the disease. In Illinois, by an intensive campaign, pneumonia mortality in serum treated cases was reduced 37.6% last year.

380 Industrial Workers of 1960. C.P. McCord. Ind. Med. 9, 173-178 (April, 1940).
The increase of persons over 50 years of age is proceeding apace -- in a few years it will be twice the present number. Now they are 1/5 of the total; at the present rate of increase, they will be 1/3 by 1960. This fact has deep significance for industry both with respect to changed demand for certain products and with the change in age groups of available industrial workers. The author holds an optimistic view for the future--that quality rather than quantity will be the trend.

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381 Integration of Industrial Hygiene with Industrial Medicine. H.G. Dyktor. Ind. Med., 9, 193-196 (April, 1940).
The official industrial hygiene unit and the plant medical department have a field in common where they may profitably cooperate. The former may make special tests, examinations and studies which the latter is not equipped or qualified to do; provide detailed and specific information on toxic substances and harmful conditions; provide comparable statistics on other plants in the same industry; furnish industrial health statistics duly interpreted; correlate work of industrial hygiene in many plants to obtain uniformity; stimulate the plant medical department to concentrate on preventive measures; and to stimulate the plant medical unit to interest itself in the worker's life outside the plant. The plant medical unit can assist by: displaying a sincere desire to improve the health of workers; supporting the official industrial hygiene unit in its educational campaign to make both employers and employees "health conscious"; supplying the industrial hygiene unit with records of absenteeism for analytical examination; advising the industrial hygiene unit of its own experience in preventive and control measures; supporting the unit in obtaining recommended improvements as soon as they have been decided upon; and cooperating in the larger concept of industrial hygiene (non-occupational diseases, housing, etc.).

382 Pre-Employment Examinations (North Carolina). M.F. Trice. Ind. Med., 9, 188-193 (April, 1940).
Physical examinations of workers and prospective employees who may be exposed to the hazards of asbestosis or silicosis are compulsory under provisions of the North Carolina Workmen's Compensation Act. To secure uniformity of findings, this work was assumed by the Industrial Commission and is carried out by the Division of Industrial Hygiene with the State Board of Health as joint sponsor.
Occupational, family, and past medical histories are taken. Physical examination, serological tests, x-ray of chest with fluoroscopy, tuberculin tests, and sputum specimens included in some cases are carried out by means of a mobile laboratory. Persons unfit for employment in dusty trades are rejected and when pulmonary tuberculosis is found or suspected, the worker is referred to a sanatorium. Those having a positive serology are informed of the fact and advised to see their physicians. In cases of death from doubtful cause, autopsies may be ordered by the Industrial Commission -- if this is denied, all right to compensation ceases.

383 Industrial Medical Education. J.Am.Med.Assoc., 114, 583-586 (February 17, 1940).
Of 52 medical schools, the average time devoted to instruction of industrial hygiene is about 5 hours. The time allotted in 24 schools is 3 hours, or less; in only seven is 10 hours or more scheduled. Twelve schools offer elective courses in industrial hygiene. Sixty per cent of recent graduates encountered industrial medical problems early in their private practice. However, only 9 schools offer definite graduate level courses in industrial hygiene. Other methods of approach to this problem are continuation courses, special society meetings, symposia on industrial health, county medical society programs, and the Congress on Industrial Health of the American Medical Association.

384 Visibility and Ease of Seeing. M. Luckiesh and F.K. Moss. Ind. Med., Ind. Hyg. Sec., 9, 33-39 (April, 1940).
Although the degree of fatigue induced by a given visual task is not now measurable in absolute terms, it may be regarded as axiomatic that fatigue is reduced when the conditions for seeing are improved. Frequency of blinking is a most convenient and sensitive criterion of the ease of seeing that has been developed. Ease of seeing as determined by the rate of blinking increases as the visibility of the visual task increases.

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385 Basic Principles of Industrial Sanitation. J.M. DallaValle and R.R. Jones. J. Am. Pub. Health Assoc., 30, 369-384 (April, 1940).
Industrial hygiene may be considered as being organized into the following divisions: Sanitation, Environmental Principles; Ventilation Requirements; Engineering Control Principles; Records and Posting of Notices. Under each of these points the authors have given details of procedures and principles. Industrial hygiene is to be considered as sanitary or public health engineering with special emphasis on the industrial environment. It should not be restricted to control of occupational diseases. It also offers the opportunity to extend the treatment of venereal diseases as well as the determination and control of malnutrition, tuberculosis and other diseases. The industrial hygienist can simplify the task of the public health administrator, who ordinarily must wait for cases to come to the attention of the family physician or clinic. Such an opportunity to reach large sections of the population cannot be disregarded.

386 Operator Fatigue is Minimized by Modern Machine Tools. Steel, 106, 50-52, 83 (April 22, 1940).
A discussion of specific improvements which not only lessen the fatigue of operators but increase their efficiency by removing mental and physical hazards. To be efficient men must be masters of their machines. Modern machine tools are as safe as any piece of machinery possibly can be.

387 Syphilis Case Finding in Industry. A.E. Russell. J.Am.Med.Assoc., 114, 1321-1324 (April 6, 1940).
Most of the principles of the control programs in tuberculosis can be applied to the control of syphilis. The interest of industry in the health of workers has proved that it pays dividends in more than one way. There are over 15 million people in the mining, metal and manufacturing trades in the United States. A syphilis program which will include this group and their families would reach about half the people of this country. The annual attack rate of syphilis per hundred thousand of population in the United States in 1935 was 796 compared with 47 in Great Britain (clinics only), 20 in Denmark and 7 in Sweden.

388 Industrial Cooperation in Syphilis Control in New Jersey. John Hall. J. Soc. Hyg., 26, 56-61 (February, 1940).
An account of the procedures used in a definite program of syphilis control in industry. Experiments in publicity and serological test programs are discussed. An attempt to have the serology conducted by private laboratories was not very successful. The results of a questionnaire sent to industries already making tests of their employees showed rates ranging from 1.7% to 4.0%. Among a group of Negro oyster shuckers 100 out of 500 were found to be syphilitic! In a group of over 3000 Negro itinerant farm workers 30% were found to be positive. Progress in this program, especially its educational features, should result in a reduction of this disease.

389 Industrial Anti-Syphilis Programs at Work. J. Soc. Hyg., 26, 82-88 (February, 1940).
A condensed report from four plants to illustrate industry's attempt to solve the problem of venereal disease among its workers. Included are a large department store, a foundry, and tractor and packing companies. When jobs are assured and tests are confidential, employees seem ready to cooperate. The program of the small foundry succeeded not only in interesting its employees but their families as well.

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390 A Syphilis Control Program in Industry. C.A. Wilzbach. J.Soc.Hyg., 26, 49-55 (February, 1940).
After two years of operation, the anti-syphilis program in Cincinnati has tested 64,000 workers. The results are entirely confidential. Many industrialists have been induced to join the program and no worker has been discharged because of positive findings. In one series of 5000 tests, 2.6% were positive. An outline of the program is given.

391 Incidence of Syphilis in Industrial Plants. H. Heimann. New York State Dept. of Labor, Industrial Bulletin, 19, 45 (March, 1940).
The syphilitic worker is a grave liability to industry. Among the reasons cited are: (1) Delay in healing of traumatic wounds, resulting in extra large compensation bills and loss of time; (2) the development of central nervous system syphilis with its associated mental symptoms resulting in lack of proper judgment and skill in the worker; (3) the chance for spread of the disease by extragenital contact is great in some lines of work where many workers must handle the material being processed; (4) the syphilitic cannot, with safety, work with substances which are liver toxins, such as carbon tetrachloride and certain chlorinated hydro carbons. A compilation of data on the incidence of syphilis in workers, collected by various authors, shows wide variation as recorded in the different investigations. Significant factors in the variations appear to be: age, sex, color, nationality, social status, and method of case finding. In an anilin dye plant no positive Wassermans were found in 61 tested. In a rotogravure plant one positive (0.9%) was discovered in 110 examinations. In a felt hat plant 143 persons were tested with two positive cases (1.3%). Out of 385 tests in the fur industry there were four positives (1.0%). Out of a total of 699 tests there were seven positive results, an incidence of 1.0%. There were two Negroes, both with negative serologies. Only 10.2% of those tested were women--all were negative.

392 Effects of Syphilis on Health and Earning Power. A. Lillywhite. J.Soc.Hyg., 26, 68-72 (February, 1940).
A presentation of the results of a study made of a group of relief applicants in Georgia. The ability to work of syphilitics and non-syphilitics was compared. A handicap of the former was apparent in all age groups: 51.9% of the infected could do hard work, 62% of the non-infected were able. A greater incidence of non-syphilitic disease was found among the syphilitic group. Syphilis contributes to the burden on the community as it incapacitates many who must be given public relief.

393 Familial Occurrence of Nystagmus of Miners. J. Ohm. Arch. f. Ophthal., 141, 20-31 (1939). (German).
The author studied 128 families with 303 persons. He concludes that nystagmus seen in families shows striking similarities in one or more of the attributes, but also some dissimilarity. The relatives of the same generation are more alike than those of different generations.

394 Comparative Investigations on the Reaction of the Lens and Cornea to Infra-Red Rays. J. Bakker. Arch. f. Opathal., 141, 170-178 (1939). (German).
Glassmakers' cataract does not arise from direct absorption of infra-red rays by the lens but by absorption of heat rays by the iris, which heats the lens, causing it to become clouded. This is the author's contention which he attempts to prove on the basis of experiments.

395 Injury to Health by Radiation in Arc Welding. LeCompte. Arbeitsschutz, pp. 9-10 (1940). (German).
An investigation into disturbances of the genitalia of arc welders by the Ministry of Labor. An extremely high portion of ultra violet rays with a very short

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wave length were found but no radiation of shorter wave length. As very sensitive instruments were used in the investigation, the author believes that there is no radiation noxious to the genital organs.

396 Industrial Health. J.Am.Med.Assoc., 114, 573-586 (February 17, 1940).
This is a general discussion of the relationships of industrial medicine and is of importance because it represents the attitude of organized medicine towards this field. The article has a wide scope, covering the general subject of industrial health, the population groups involved, the unequal character and distribution of industrial medical services, effects of occupation on health, industrial accidents, occupational diseases, ordinary illness in industry, the physician in industry, industrial hygiene, physical supervision, therapy, functions of the medical service in industry, industrial health activities in organized medicine, industrial health in the government, and industrial medical education. It is believed that the principal causes of lost time to industry are the diseases and complaints found in general practice but the industrial physician usually only diagnoses and treats minor injuries and ailments. His opportunity in the larger field of general health protection is being grasped more fully. The inadequacy of training in industrial medicine is revealed by the fact that the average amount of time devoted to industrial hygiene in medical schools is barely in excess of five hours. This can hardly be remedied as long as the opportunities in the field of industrial health are so few. Little advantage has been taken of the advanced training centers in heavily industrialized communities, showing that there is evidently small demand for this field of practice.

Papers on Industrial Poisons, Cancer, Dermatitis, etc.

397 Ascorbic Acid in the Treatment of Chronic Lead Poisoning. A.M. Dannenberg, A.H. Widerman and P.S. Friedman. J.Am.Med.Assoc., 114, 1439-1440 (April 13, 1940).
"Extremely large doses of ascorbic acid were without effect in the treatment of lead intoxication in a child aged 27 months."

398 Lead Poisoning in Roofers. H.J. Magnuson and B.O. Raulston. J.Am.Med.Assoc., 114, 1528-1530 (April 20, 1940).
All of the patients involved here gave a history of holding galvanized roofing nails in their mouths while working. Analysis of the coating of the nails showed that they contained 3% lead. The explanation for this sudden outbreak is attributed to a change in type of nails used. Although galvanized nails had been advocated for the past ten years, it has only been since early in 1939 that Federal Housing Administration specifications stimulated their use. By study of the solubility of lead in saliva, it was found that significant amounts of the element were dissolved. Although the men had not been told to put the nails in their mouths, they contended that they could not work fast enough to earn an adequate wage unless they used this method. The authors feel that the spectrographic determination of lead in the whole blood is of definite diagnostic value.

399 Determination of Small Amounts of Cadmium in Air. S.S. Gurvits. Zavodskaya Lab., 8, 424-427 (1939). (Russian).
The lack of sensitivity of colorimetric methods for determining cadmium in air is due to the colloid stabilizers which decreases the intensity of the coloration by 65-70%. To avoid this error the cadmium was determined colorimetrically with a selonium photocell in a 20% sodium sulfide solution without a stablizer. The reagent is sensitive for 0.03-0.04 mg. of cadmium in 25 cc. solution. For the range 0.004-0.36 mg. of cadmium, the error was from -1.4 to +9%. Small amounts of cadmium up to 0.3 mg. can thus be determined in the presence of 15-20 times as much zinc with an error up to 8.6%.

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400 Lead-Bearing Steels: Control of Possible Health Hazards During Fabrication. J.W. Halley and E.D. Martin. Metal Prog., 37, 412-418 (April, 1940).
Experimental work on leaded steels shows that no lead is given off by the solid steel, even though heated. The 0.25% lead is dispersed throughout the metal in small particles and since lead is insoluble in iron it cannot migrate to the surface. If the steel is turned to scale or melted, the lead in the metal so altered becomes available and a certain proportion of it passes into the air. The proportion of lead released under various conditions has been determined, so that simple engineering calculations will show whether a hazard can develop under any particular circumstances. The amount of lead given off at any but the highest temperatures is so small that no calculations are necessary. This investigation indicates that there is no health hazard in handling, machining, heat treating or in ordinary forging of lead-bearing steels. The most rapid rate of lead release is caused by oxygen cutting and arc welding, and in most cases calculations will show that an exhaust system is needed, or that the work should be done out of doors. In practically all cases the amount of air to be moved for satisfactory exhausting is small, and inexpensive equipment will be effective.

401 Basophilic Aggregation Test (For Lead Absorption and Lead Poisoning). Ohio Dept. of Health, Adult Hyg. Div., 7 pp. (1940).
A short booklet giving in concise form the technique and interpretation of results of the basophilic aggregation test.

402 Automatic Detection and Estimation of Dangerous Concentrations of Ammonia and Sulfur Dioxide in Air. B.A. Zaitsev. Zavodskaya Lab., 8, 679-688 (1939). (Russian).
The detection and automatic estimation of dangerous amounts of ammonia and sulfur dioxide by various methods is described. A tentative method was developed in which the air and the absorbing liquid are passed through a special coil and then through a gas separator from which the liquid is separated and its changing pH measured with an automatic photoelectric colorimeter equipped with optical or sound-signal devices. The absorbing fluids were 0.0005 N sulfuric acid for ammonia and 0.0005 N hydrogen perioxide for sulfur dioxide, with 4 mg./ liter of bromphenol blue indicator for both. The sensitivity of the apparatus can be varied by changing the ratio of air velocity to the velocity of the absorbing liquid. Diagrams of the apparatus are included.

403 Colorimetric Determination of Mercury in Air by Means of Dithizone. N.S. Kuzyatina. Zavodskaya Lab., 8, 174-177 (1939). (Russian).
Two absorption tubes containing 5 mg. of 0.1N potassium permanganate and 5 cc. of 10% sulfuric acid are used for passing the air through at the rate of 60-80 liters per hour. After the absorption, an aliquot part of the potassium permanganate solution is taken, the permanganate is reduced to manganese by the addition of a slight excess of chromic acid at room temperature and the mercury content of the solution determined by shaking with 0.05-0.1 cc. portions of a solution of 1.2 mg. dithizone in 100 cc. of chloroform and comparing the resulting color with that of standards in a colorimeter. Details are given.

404 Determination of Lead in Air by Means of Dithizone. V.M. Prikhnya. Zavodskaya Lab., 8, 285-286 (1939). (Russian).
Modified Palmer tubes containing nitric acid as an absorbing agent were used for the determination of lead in air. Two tubes in parallel and one control tube were used. At an air speed of 10 l.p.m. the control tube was found to contain no lead.

405 Portable Apparatus for Exact Analysis of Mine Gases, Motor Exhaust, Etc. A. Schmidt. Gluckauf, 75, 198-203 (1939).
A description of a portable apparatus employing the manometric method of analysis, giving high accuracy with large measuring range. A table for pressure corrections due to changes in temperature during the analysis is given.

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406 Pyrotannic Acid Method for Determination of Carbon Monoxide in the Blood. H. Komatu. J. Oriental Med., 30, 775-783 (English Abstr., 191) (1939).
The 10% error usually attributed to the Sayers method (cf. Chem. Abstr. 20, 60) can be reduced to 1%, if the standard is made up of blood of the same species. Carbon monoxide is first washed through potassium hydoxide solution, exactly the same concentration of pyrogallol as tannic acid is used in both, the sample blood is diluted 1:20, and the standards are made up in 5% steps.

407 Methods for the Detection of Toxic Gases in Industry. Carbon Monoxide. Leaflet No. 7. Great Britain, Dept. of Scientific & Industrial Research. H.M. Stationery Office, London, 1940.
This is another of a series on the detection of toxic gases in industry. A standard method has been developed for carbon monoxide which consists in drawing samples of air through a known area of test paper, treated with palladium chloride, at a slow and constant rate, by means of a 5 liter aspirator. This method enables interfering gases to be removed by allowing the sample to pass first through a tube of activated charcoal. Sampling is continued until a stain is obtained on the test paper which compares with the standard color chart (supplied with the leaflet); the concentration present is then determined by comparing the time required to reach the necessary color with the time given on the chart. In this way concentrations of 1 part in 500 can be detected in less than 2 minutes, and of 1 part in 10,000 in half-an-hour. Full instructions for preparing the test papers and for carrying out the test are contained in the leaflet.

408 Estimation of Carbon Disulfide. A. Castiglioni. Ann. chim. applicata, 29, 196-198 (1939). (Italian).
It has been shown that carbon disulfide will form a precipitate with piperazine, with the composition $C_4H_{10}N_2CS_2$. The reaction is quantitative only in the presence of a larger excess of piperazine. The reaction takes place best with 95% ethyl alcohol as solvent. The precipitate is dried at 105°. Determinations can be made within 0.1-0.2%. For the determination of vaporous carbon disulfide, the air can be bubbled through a concentrated alcoholic solution of piperazine.

409 Starch-Iodide Method of Ozone Analysis. C.E. Thorp. Ind. & Eng. Chem., Anal. Ed., 12, 209 (April 15, 1940).
The use of a buffer solution was found to greatly increase the sensitivity of the potassium iodide reaction without introducing an error such as is caused by the addition of free acid. This solution consists of 5 grams of aluminum chloride hexahydrate and 1 gram of ammonium chloride, made up to 1 liter. Five cc. of this solution are added to each 100 cc. of potassium iodide test solution before the test is run. The solution should not be acidified during the titration. This will give a minimum sensitivity of 0.00062 mg. of ozone per cc. of potassium iodide. Commercial ozonizers produce as high as 75% impurities in the form of oxides of hydrogen and nitrogen. Potassium iodide will liberate free iodine in the presence of these gases also. An absorption bottle containing chromic acid and a tube containing potassium permanganate should be provided to make sure that only pure ozone reaches the test bottle.

410 Detoxication of Lead. E. Hesse. Klin. Wochschr., 19, 104 (1940). Abstr. from Squibb Abstr. Bull., 13, 496 (April 24, 1940).
When rabbits were administered sodium 8-hydroxy-5-quinolinesulfonate, their tolerance for basic lead carbonate was doubled. When liver extract (campolon) is given simultaneously, the toxicity of the lead compound is reduced to one-seventh of its normal value. These two substances will also render rabbits lead fast, i.e., they will tolerate the basic lead carbonate as long as the antidotes are given simultaneously.

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411 Removal of Nitrous Fumes from Mine Air. H.C. Dod. Chem. Eng. Mining Rev., 31, 494-495 (1939). (Australian).
The removal of NO_2 by ammonia with the formation of the nitrate and ammonium nitrate is accomplished by "bullets" of chemical used with the explosive.

412 Health Aspects of Oxyacetylene Processes. A.G. Cranch. Steel, 106, 73 (April 22, 1940).
Carbon monoxide is encountered so rarely in oxyacetylene processes as not to be a health hazard. Zinc, cadmium and lead fumes are a definite hazard, as are the fluxes containing fluorides. Ventilation is the best safeguard for these problems, especially for working in confined spaces.

413 Mechanism of Development of Lead Anemia. IV. The Physiochemical Nature of the Splenic and Liver Substances which Decrease Erythrocytes. S. Kin. J. Med. Coll. Keijo, 9, 101-107 (1939). (Japanese).
After injection with lead acetate, the spleen and liver seem to contain some specific chemical substances which are able to decrease the number of erythrocytes. The author attempted to determine the physiochemical nature of these substances which were obtained from the splenic and hepatic veins after injection of the lead. The anemic action of the splenic substance disappeared after heating for an hour at 100°. The substance was soluble in water, but did not dissolve in ether and alcohol; it was adsorbed easily by animal charcoal or kaolin. Its action was also retained after ulta-violet radiation for three hours.

414 Rate of Elimination of Carbon Monoxide from the Blood of Survivors. L. Breitenecker. Beitr. z. ger. Med., 4, 98-138 (1938). (German).
A study of the sequelae of carbon monoxide poisoning in eight light cases without unconsciousness and with quick recovery, seven serious cases with prolonged unconsciousness but recovery, six cases with unconsciousness lasting until death ensued. Unconsciousness develops when nearly half the hemoglobin is bound to the carbon monoxide. The gas is eliminated in from 10 to 24 hours and this period has no relation to the seriousness of the symptoms. If the poisoning occurs quickly, consciousness will be recovered at the level of 50% carboxyhemoglobin. It persists longer if the poisoning came about slowly. In these cases it may last until death occurs, which may not take place for several days, although the carbon monoxide is entirely eliminated and there are no secondary diseases. The duration of exposure seems more important than the percentage of carbon monoxide in the blood. These investigations show that the results of animal experiments may only be applied to man very cautiously, as carbon monoxide never disappears from human blood as quickly as is described in animals.

415 Skin Hazards in American Industry. Part III. L. Schwartz. U.S. Public Health Bulletin No. 249, 99 pp., 23 illustrations (1939).
This booklet by the well-known authority on this subject contains a discussion of the skin hazards to be found in the following industries: citrus fruit; cigar; acid; pulp and paper; organic solvents; chromic acid and chromates; iron and steel; paints, varnishes and lacquers; glass; photographing, photoengraving, lithographing, printing, typewriting and hectographing; and explosive manufacture. There is a bibliography but no index. Copies are obtainable from the Superintendent of Documents, Washington, D.C., for 35 cents.

416 Rat Mite Dermatitis. L.F. Weber. J. Am.Med.Assoc., 114, 1442 (April 13, 1940).
Bites and dermatitis from scratching in several department store workers led to the discovery that it was due to a rat mite (Liponyssus bacoti). Whenever rats are driven from a building and bites appear on people living or working there, the presence of rat mites should be investigated.

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417 Industrial Dermatitis from Gloves. W.D. Norwood and E.E. Evans. J.Am.Med. Assoc., 114, 1523-1528 (April 20, 1940).
Studies of an eczematoid type of industrial dermatitis of the hands appearing in workmen wearing leather gloves was shown to be caused by two factors: (1) the traumatizing effect of the gloves, and (2) allergic sensitization of the hands due to the presence of dermatophytosis elsewhere (usually on the feet). The authors believe that since dermatophytosis of the feet is almost universal among industrial workers, "glove phytids" will be recognized with great frequency. A method of treatment was used which gave good results.

418 Dermatitis from Orthodichlorobenzene. J.G. Downing. J.Am.Med.Assoc., 112, 1457 (1939).
This is a report of the sensitivity of a glazier to a solution in which window sashes had been dipped. It was proven by observing the reaction when the substance was dropped on the arm. In a similar manner it was demonstrated that the guilty ingredient was orthodichlorobenzene, which has become industrially important as a solvent and wood preservative.

419 Onychia Due to Handling Sugar. C.L. Cummer. Arch. Derm. & Syphil. (Soc. Trans.) 41, 142-143 (January, 1940).
A woman working in a bakery, handling jams and jellies, had practically all her fingernails affected. Some nails were stripped off, others were split and lifted from the bed. Granular tissue could be broken away when the nail plate was lifted. No mycelium or spores were found on microscopic study. When the woman stopped her work and after treatment with x-rays and boric acid ointment and solutions, the condition cleared up. There is a photograph of the damaged nails.

420 Factors Influencing Carcinogenisis with Methylcholanthrene. III. The Effect of Solvents. M.B. Shimkin and H.B. Andervont. U.S. Public Health Reports, 55, 537-545 (March 29, 1940).
Solvents exert a definite effect upon the latent period and incidence of carcinogenisis with methylcholanthrene injected subcutaneously in the dissolved state into inbred strains of mice. The latent period is very short when tricaprylin is used, and over twice as long when butyl phalate is the solvent. Significant differences in the production of tumors are observed with solvents of heterogeneous nature. Tricaprylin seems to be the most consistent and rapidly acting solvent for methylcholanthrene of those tested but has the disadvantage of present high cost.

421 Gangrene of a Foot Following Carbon Monoxide Poisoning. J.A. Wilson and W.C. Carey. Ind. Med., 9, 197-198 (April, 1940).
Description of a case of carbon monoxide poisoning in a man 72 years of age with the somewhat unusual sequel of gangrene of an extremity.

422 Chronic Arsine Poisoning Among Workers Employed in the Cyanide Extraction of Gold: A Report of 14 Cases. F.M.R. Bulmer, H.E. Rothwell, S.S. Polack and D.W. Stewart. J. Ind. Hyg. & Toxicol., 22, 111-124 (April, 1940).
A minor variation in procedure and gradual decrease in natural ventilation due to the onset of cold weather resulted in these cases of chronic arsine poisoning. Blood findings, arsenic determinations of pubic hair and urine, blood chemistry, symptoms and physical findings, including electrocardiographic interpretations are presented and discussed. Workers with an unaccountable decrease in red blood cells and hemoglobin should be examined carefully and removed from work. Marked stippling of the red blood cells in the absence of a lead exposure should also be regarded with suspicion. In the treatment of these cases whole blood transfusion and iron therapy were of real value especially in men presenting marked blood impoverishment.

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423 Effects of Sulfur Dioxide on Plants and Animals. C. Setterstrom. Ind. & Eng. Chem., 32, 473-479 (April, 1940).

Apparatus was designed and constructed for the purpose of conducting a series of experiments testing the effects on plants and animals of exposure to low concentrations of sulfur dioxide. The present paper is concerned particularly with the industrial and engineering aspects of the work. Precise control of the gas concentrations and at least partial control of other important factors such as temperature and humidity were achieved. Records kept over a period of two years of the sulfur dioxide concentrations in the atmosphere showed an average of 0.034 p.p.m. and a maximum of 0.75 p.p.m. Factorial experiments were of use in interpreting the results of quantitative data and in obtaining the maximum amount of information from a given expenditure of time and energy. This followed a logical and systematic contrasting of pairs (or groups) of plants, the members of each pair having been given identical treatment except in respect to the factor under investigation. The experimental data were subjected to statistical study by the method of the analysis of variance. Alfalfa was selected as the principal test plant because it is sensitive to sulfur dioxide and is of considerable economic importance in several of the large agricultural areas which are subjected to sulfur dioxide. Under none of the conditions studied (exposure to 0.10-0.20 p.p.m. of sulfur dioxide up to 25 days) was there decrease of yield of alfalfa, under most of the conditions it had no significant effect on yield, and under some of the conditions it brought about significant yield increases. The data indicates that deficiencies in sulfur content of nutrient supply were made up by absorption of sulfur dioxide from the air. Alfalfa grown with a deficient supply of water seemed to respond more readily to the stimulating effect of the sulfur dioxide. In general, resistance to sulfur dioxide decreased with increase in relative humidity though differences of at least 20% appeared necessary to cause detectable degrees in susceptibility in the range above 40 per cent. Young plants were much more resistant to injury than older plants. Middle-aged leaves were the most susceptible. In the animal studies guinea pigs, mice, grasshoppers and cockroaches were used as experimental material. No significant mortality or signs of distress occurred among healthy animals at concentrations of 33 p.p.m. or below. A longer exposure to the gas was necessary to cause mortality when the sulfur dioxide treatments were given in intermittent doses. Signs in living exposed vertabrate animals at the higher concentrations included lethargy, rhinitis, lachrymation, coughing, conjunctivitis, moderate dyspnea, distention of the abdomen, weakness, and paralysis of the hind quarters. The results clearly indicate that concentrations of sulfur dioxide such as prevail in city atmospheres have no direct effect on health. The possibility of indirect effect cannot be evaluated from the data given in this paper.

424 Toxicity of Ammonia, Chlorine, Hydrogen Cyanide, Hydrogen Sulfide, and Sulfur Dioxide to Fungi, Green Plants, and Animals. A Preliminary Report. Carl Setterstrom, Boyce Thompson Institute for Plant Research, Inc., Yonkers, N. Y.

This paper constitutes a preliminary report of the results of a rather comprehensive study of the toxicity of several industrial gases to a number of organisms. Concentrations tested varied from 1.0 to 1000 p.p.m. in dose intervals of four. Organisms were exposed for periods ranging from one minute to 16 hours. Organisms tested included eight plant fungi; two animal pathogens; rye and radish seeds; tomato, buckwheat, and tobacco plants; flies, mice, and rats. Data are presented showing susceptibility of each one of the organisms to each of the gases over the range of concentrations and exposure periods. Studies of the effects of each of the gases on pH of soil, agar, and expressed plant juices are summarized. Relative toxicity of the gases to the organisms and relative susceptibility of the organisms to the gases are noted.

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425 Benzene Poisoning. I. Gray, I. Greenfield and M. Lederer. J.Am.Med.Assoc., 114, 1325-1330 (April 6, 1940).
Chronic poisoning results from the inhalation of benzene in industries where it is used as a solvent and evaporates into the air of the workroom. Hemopoietic (blood-forming) insufficiency, varying from mild anemia to complete aplasia which is incompatible with life, may result from such an exposure. This is an account of a fatal case of chronic benzene poisoning in a pressman who had been exposed to the vapors from colored inks. Blood studies showed a very low white cell count -- dropping from 2,800 to 500 shortly after admission to the hospital. A diminution of the granular types of white cells was accompanied by a marked increase in the lymphocytes. From the prognostic point of view, repeated blood studies seem of greater value than urinary sulfate determinations after the exposure to benzene has ceased. White cell counts below 1000 give a very grave prognosis. This patient also revealed the phenomenon of autohemagglutination.

426 Functioning and Reacting Ability of the Blood Forming Organs in Chronic Benzene Inhalation: Experimental Investigations. M. Schmittmann, H. Linnig and F. Camerer. Arch. f. Gewerbepath., 9, 719-737 (1939). (German).
Exposure to small concentrations of benzene in air seems to result in a decrease in leucocytes with a relative lymphocytosis but no symptoms. In workmen exposed thusly, minor infections produce a leucocytosis, especially of the monocytes which may be 90% of all leucocytes. Normal experimental animals respond to irritating injections by leucocytic reactions -- a decrease of granulocytes followed by a rise. There is also a leucocyte rise caused by an increase of lymphocytes, a leucocytic reaction of the spleen and bone marrow. In animals which had previously inhaled benzene, there was an endotheial reaction: the granulocytes and lymphocytes fall only a little after equalization of the first rise. In the spleen there was marked phagocytosis of the proliferated endothelium

427 Further Studies on the Absorption, Mobilization, and Excretion of Lead. S. L. Tompsett. Brit. J. Exp. Path., 20, 512-516 (December, 1939).
Animal experimentation shows that inclusion of hydrochloric acid in a lead-containing diet increases absorption from the alimentary tract. Ammonium chloride, potassium chloride, and sodium carbonate fed with both high and low calcium diet increased the blood mobilization of lead. After lead ingestion ceased, a large part is excreted within 14 days on low calcium diet, and a substantial amount even on high calcium diet.

428 The Metabolism of Nucleoproteins in Lead Poisoning. G. Michotte and F. Molfino. Rass. med. ind., 10, 562-582 (1939). (Italian).
Original research on ten cases of lead poisoning shows a pronounced tendency to uric acidemia becoming more acute as the poisoning tends towards chronicity. No relation was seen between the degree of uric acidemia and kidney function, and no such connection is likely to exist in cases of recent lead poisoning.

429 Vitamin C Treatment of Chronic Benzene Poisoning Among Photoengravers. J. Hagen. Arch. f. Gewerbepath., 9, 698-704 (1939). (German).
Four photoengravers had slight changes in the blood picture. While still working, they were treated with vitamin C and the blood findings improved. The author recommends that in the supervision of workers ascorbic acid in urine be determined as well as making blood examinations and that where the concentration in the urine is low that vitamin C be given both prophylactically and therapeutically, along with other remedies.

430 Cadmium and Its Compounds. Ohio Dept. of Health, Adult Hyg. Div., 6 pp. (1940).
A short booklet giving in concise form general information, industrial use, selected abstracts and a list of references on this element and its compounds.

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Bulletin

A special meeting of those members of Air Hygiene Foundation, interested in the Foundation's survey of "Sick Absenteeism in Industry," will be held at Mellon Institute, Pittsburgh, on Monday, May 27, at 10 A.M., (Eastern Daylight Time.) This is an "instruction" meeting for companies desiring to participate, or desiring more information about the survey, described in Medical Bulletin No. 4 which was sent to members recently.

The specialists directing the work will give complete details on the mechanics whereby participating companies can check up on their losses through sick absenteeism. Questions which companies may wish to ask will be answered fully. Forms for recording absences will be explained, etc. The speakers are:

Dr. A.J. Lanza, Chairman, Foundation's Medical Committee
Dr. R.R. Sayers, Representing Public Health Service and Association of Industrial Physicians and Surgeons
Dr. C.D. Selby, Medical Consultant, General Motors Corporation
Dr. W.M. Gafafer, Senior Statistician, Public Health Service
Mr. R.J. Vane, Statistician, Metropolitan Life Insurance Company.

Dr. Lanza will outline the subject. Dr. Sayers will explain the collaboration of the Public Health Service. Dr. Gafafer and Mr. Vane will explain the technical details, the "do's and don'ts." Dr. Selby will speak from the experience of a company engaged in such a survey, amount of clerical work, expense, etc.

This survey is a kind of planned "inventory" which the Foundation offers its member companies as an opportunity for them to reduce their losses through sick absenteeism. If your company is interested please return the enclosed form indicating whether you will be represented.

Air Hygiene Foundation
4400 Fifth Avenue
Pittsburgh, Pa.

May 8, 1940

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The _____ will be represented
(name of company, association, etc.)

by _____ at the "instruction"
(name and title of representative)

meeting on "Sick Absenteeism in Industry" which will be held by Air Hygiene Foundation at Mellon Institute, Pittsburgh, on Monday, May 27, 1940, at 10 A.M. Eastern Daylight Time.

Signature: _____

Title: _____

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