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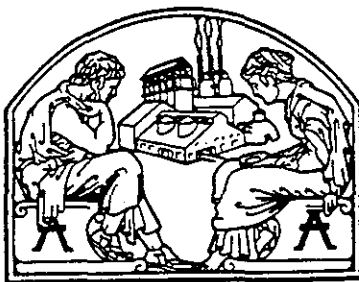
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# *Industrial Hygiene Digest*

**INDUSTRIAL HEALTH NEWS**

**LITERATURE ABSTRACTS**

**MEDICAL**

**ENGINEERING**

**CHEMICAL**

**TOXICOLOGICAL**

**LEGAL**

**FEBRUARY, 1961**

**(Vol. 25, No. 2)**

**INDUSTRIAL HYGIENE FOUNDATION**

**MELLON INSTITUTE**

**4400 FIFTH AVENUE •• PITTSBURGH 13, PA.**

**03120730**

NOVEMBER 1992

IN RE: A.B.R.A.M.S.

## INDUSTRIAL HYGIENE FEATURES

The cardiac patient in industry is the topic of Abst. No. 128.

For a discussion on the verrucous carcinoma of the buccal mucosa in tobacco chewers consult Abst. No. 130.

An evaluation concerning the efficiency of an ethylene oxide sterilizer in hospital practice is presented in Abst. No. 132.

Abst. No. 136 describes the inadequacy of dermabrasion in the therapy of nevi.

The collection and determination of chromium in an urban atmosphere is the title of Abst. No. 143.

Abst. No. 145 presents a method for the determination of mercury in blood.

A survey of the lead hazard in indoor firing ranges is given in Abst. No. 147.

Abst. No. 155 is concerned with an evaluation of an aerosol photometer for dust counting and sizing.

Experiences with phase microscopy are described in Abst. No. 156.

Abst. No. 163 presents ceruminosis, a factor in audiometry.

Information on food preservation by ionizing radiation is given in Abst. No. 170.

For a description of a method for monitoring sulfur dioxide with lead peroxide cylinders consult Abst. No. 181.

Abst. No. 183 gives a spectrophotometric method for the determination of mercaptans in air.

Data on the correlation of dust scrubber efficiency are given in Abst. No. 185.

The control of odors from a continuous soap making process is the subject of Abst. No. 198.

See Abst. No. 201 for a practical approach to the management of acute alcoholic intoxication.

## FOUNDATION FACTS

The Annual Index to Industrial Hygiene Digest for 1960 is being mailed to members along with this issue of the publication. It provides a quick reference to the 1233 abstracts of literature on industrial health which appeared in the Digest last year.

"G Men" on Job Hazards----Industrial hygienists take over to cope with health problems in our advancing technology----a reprint from the Journal of American Insurance, January 1961, is also enclosed.

The Executive Committee of the Board of Trustees of I-H-F held its first meeting for 1961 on February 2 at the Foundations's headquarters.

Dr. Marian Westrick, the Foundation's Toxicologist, recently resigned to be married. Her duties have been taken over by James M. McNerney who had worked with Dr. Westrick for several years. Mr. McNerney has also been appointed Secretary of our Chemical-Toxicological Committee. The Toxicological Research Laboratory added two assistants to its staff: Marianne Kaschak, a biochemist, and Guy Dent, a technician.

Dr. H. H. Schrenk attended meetings of the Pennsylvania Air Pollution Commission in Harrisburg, and the Editorial Board of the Archives of Environmental Health in Detroit.

26th ANNUAL MEETING

OCTOBER 25 - 26, 1961

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## TABLE OF CONTENTS

|                                               | <u>Page</u> |
|-----------------------------------------------|-------------|
| News Items . . . . .                          | 1           |
| Occupational Disease Statistics . . . . .     | 2           |
| Coming Events . . . . .                       | 3           |
| Legal Developments . . . . .                  | 3           |
| Books, Pamphlets and Notices . . . . .        | 5           |
| Industrial Medical Practice . . . . .         | 7           |
| Skin Diseases and Burns . . . . .             | 10          |
| Chemical Hazards. . . . .                     | 11          |
| Industrial Dusts. . . . .                     | 14          |
| Physical Aspects of the Environment . . . . . | 18          |
| Radioactivity and X-Radiation . . . . .       | 19          |
| Environmental Measurements . . . . .          | 21          |
| Preventive Engineering . . . . .              | 23          |
| Community Air Hygiene. . . . .                | 24          |
| Management Aspects . . . . .                  | 27          |
| Accidents and Prevention . . . . .            | 29          |
| Miscellaneous . . . . .                       | 30          |
| Index . . . . .                               | 32          |

03120732

INDUSTRIAL HYGIENE DIGEST  
Literature and News

NEWS ITEMS

105 Anatomy for Lawyers.

Western Reserve University's Law-Medicine Center will offer a new four-part program entitled "Anatomy for Lawyers" designed for persons using medico-legal knowledge in their work. Part I will start February 20 and will be held each consecutive Monday through May 29 from 7:30 p.m. to 9:30 p.m. This segment will include: anatomical position, regions of the body, terms of direction, planes of the body, osteology, muscles of upper extremity and shoulder girdle, brachial plexus, articulations, arteries and veins and dissection. Tuition including materials will be \$75. Part II, involving the lower extremity, will be offered in the fall semester of 1961; Part III, involving the nervous system, in the spring semester, 1962; and Part IV, involving heart, respiratory, digestive, urogenital and ductless glands systems, in the fall semester, 1962. Each of these four parts is an independent unit of study. Persons may enroll for a single part or the several parts as desired. The Law-Medicine Center, a cooperative activity of Western Reserve University and the Cuyahoga County Coroner's Office, is now beginning its ninth year of service in education, research, and publication. Further information may be obtained from Oliver C. Schroeder, Jr., Director, Law-Medicine Center, Western Reserve University, 2145 Adelbert Road, Cleveland 6, Ohio

106 Refresher Course in Industrial Medicine.

The School of Hygiene, University of Toronto, is holding the second Annual Refresher Course in Industrial Medicine from March 6 to March 9, 1961. The topic will be "The Early Diagnosis of Disease in Industry". Further information may be obtained from the University of Toronto, School of Hygiene, Toronto 5, Canada.

107 Air Pollution Foundation to Disband.

The Air Pollution Foundation, San Marino, California, plans to disband in early 1961 now that the end of Los Angeles' smog siege is in sight, says Mr. W. L. Faith, the Foundation's managing director. Organized in 1953, the Foundation has studied the nature of smog and suggested methods by which it could be eliminated. -- Chem. Eng. News

108 Paraformaldehyde.

Properties and essential information for the safe handling and use of paraformaldehyde are described in a new chemical safety data sheet published by the Manufacturing Chemists' Association. Paraformaldehyde is a mixture of polyoxymethylene glycols containing 90 to 99% polymerized formaldehyde. It varies in degree of polymerization, and is available commercially in both powder and granular form as follows: 91 to 92% Flake; 94 to 95% Powder; 95 to 99% U.S.P. X. and Photographic. The toxicity of paraformaldehyde is similar to that of formaldehyde. In some ways it is less hazardous since it is less reactive. It is toxic by oral intake. The vapors are irritating to the eyes and upper respiratory tract. Although a threshold limit value of 5 ppm by volume in air has been set by some agencies as the safe concentration for an 8-hour exposure, this concentration may prove uncomfortable for some

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exposed persons. Paraformaldehyde has a characteristic odor and is irritating to the eyes and upper respiratory passages. Paraformaldehyde is a combustible solid having a flash point below its melting point. Generation of dust is usually accompanied by vapors. Care must be exercised in handling and storage to keep paraformaldehyde away from flame, sparks or highly heated surfaces as it will burn readily. If heated, it gives off flammable formaldehyde vapor. Paraformaldehyde dust may form an explosive mixture with air. Formation of water solution evolves formaldehyde which is flammable. Copies of Chemical Safety Data Sheet SD-6 on Paraformaldehyde are available at 30 cents each from the Manufacturing Chemists' Association, Inc., 1825 Connecticut Ave., Washington 9, D.C.

#### 109 Hygienic Guide Series.

The following additional Hygienic Guides are now available: Stibine (Antimony Hydride), Phosgene (Carbonyl Chloride), n-Butylamine (1-Aminobutane), and Dioxane (Diethylene-1,4 dioxide). They are given in the December *AIHA Journal* (pp. 529-534) and can be obtained from the American Industrial Hygiene Association, 14125 Prevoist, Detroit 27, Mich., at 25 cents each.

-- Am. Ind. Hyg. Assn. J.

### OCCUPATIONAL DISEASE STATISTICS

#### 110 Occupational Disease Statistics. (Cases reported to the respective Health Departments.)

|                              | Colo.<br>Nov. | Conn.<br>Nov. | Ind.<br>Oct. - Dec. | Pa.<br>Dec. - Jan. | Tenn.<br>Dec. | Total |
|------------------------------|---------------|---------------|---------------------|--------------------|---------------|-------|
| Dermatitis                   | 28            | 21 *          | 5 *                 | 12                 | 11            | 77    |
| Fumes (unidentified)         |               |               |                     | 3                  |               | 3     |
| Hepatitis (infectious)       | 2             |               |                     | 1                  |               | 3     |
| Insecticide (unknown)        | 2             |               |                     |                    |               | 2     |
| Lead poisoning               |               |               | 1                   |                    | 1             | 2     |
| Paint poisoning              |               |               | 1                   |                    |               | 1     |
| Perchloroethylene            |               |               | 1                   |                    |               | 1     |
| Plastic chemicals            |               | 1             |                     |                    |               | 1     |
| Pneumoconiosis               |               |               |                     | 66                 |               | 66    |
| Pneumoconiosis (suspected)   |               |               |                     | 10                 |               | 10    |
| Respiratory infection        |               |               |                     | 1                  |               | 1     |
| Silicosis                    | 1             |               | 1                   | 4                  |               | 6     |
| Silicosis (suspected)        |               |               |                     | 1                  |               | 1     |
| Trichloroethylene            |               | 1             |                     |                    |               | 1     |
| Tuberculosis                 |               |               |                     | 2                  |               | 2     |
| Undulant fever (Brucellosis) |               | 1             |                     |                    |               | 1     |
| Miscellaneous                | 2             |               |                     |                    |               | 2     |
| Total                        | 35            | 24            | 9                   | 100                | 12            | 180   |

\* Causes are listed as follows:

Connecticut: Occupational dermatitis due to oils and greases, 4; occupational dermatitis due to solvents, 4; occupational dermatitis due to other chemicals: glues 1, multi-chemicals 3, paint 1, synthetic resins or resin compounds 2; occupational dermatitis—other: infection 3, soaps or detergents 1, miscellaneous 2.

Indiana: Electroplating solutions 1; sand 1; organic solvents 1; cause not stated 2.

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## COMING EVENTS

- 111 Feb. 26-Mar. 1 American Institute of Chemical Engineers, National Meeting, New Orleans, Louisiana
- Feb. 26-Mar. 2 American Institute of Mining, Metallurgical, and Petroleum Engineers, Annual Meeting, St. Louis, Mo.
- Feb. 27-Mar. 3 Conference on Analytical Chemistry and Applied Spectroscopy, Pittsburgh, Pennsylvania
- Feb. 28-Mar. 3 Colorado State Medical Society, Midwinter Clinical Session, Denver, Colo.
- Mar. 1-2 27th Annual Regional Safety and Fire Conference and Exhibit, Philadelphia, Pennsylvania
- Mar. 5-7 Southern Safety Conference and Exposition, Atlanta, Georgia
- Mar. 6-9 American College of Surgeons, Sectional Meetings for Surgeons, and Graduate Nurses, Philadelphia, Pennsylvania
- Mar. 6-9 New Orleans Graduate Medical Assembly, New Orleans, Louisiana
- Mar. 6-9 Southeastern Surgical Congress, Miami Beach, Florida
- Mar. 8-11 Neurosurgical Society of America (members and guests) Boca Raton, Florida
- Mar. 9-11 Eastern Conference of Radiology, Baltimore, Maryland
- Mar. 12-17 American College of Allergists, Dallas, Texas
- Mar. 13-16 National Health Council, National Health Forum, "Health and Communication" New York, New York
- Mar. 14-15 Northeastern Indiana Safety Conference and Exhibit, Fort Wayne, Indiana
- Mar. 18-21 Missouri State Medical Association, Kansas City, Mo.
- Mar. 20-22 Dallas Southern Clinical Society, Dallas, Texas
- Mar. 20-24 American Surgical Association, Boca Raton, Florida
- Mar. 21-30 139th National Meeting, American Chemical Society, St. Louis, Mo.
- Mar. 23-25 American Orthopsychiatric Association, New York, New York
- Mar. 27-31 Temperature—Its Measurement and Control in Science and Industry. American Institute of Physics, Instrument Society of America, Columbus, Ohio
- Mar. 28-31 American Association of Anatomists, Chicago, Ill.
- Apr. 5-7 Annual Conference and Corrosion Show of National Association of Corrosion Engineers, Buffalo, New York
- Apr. 9-13 Annual American Industrial Hygiene Conference, Detroit, Michigan
- Apr. 9-14 American Industrial Health Conference, Los Angeles, Calif.
- Apr. 18-20 Annual Convention, American Welding Society, New York, New York

## LEGAL DEVELOPMENTS

112 When is Disease Contracted?

Anderson, an employee of the Minneapolis Fire Department, was examined in 1954 by a doctor and told that he had coronary sclerosis. Although the doctor advised him that his work was dangerously strenuous, Anderson did not quit, nor did he tell his employer about it. In early 1957, his condition became worse, and he finally had to resign from the fire department. He entered a claim for compensation due to his being disabled by an occupational disease. One Minnesota law said that in order for an occupational disease to be compensable, it must have been contracted within 12 months before it became disabling. But the law continued that when a fireman has coronary sclerosis, it will be presumed that he contracted



it during the 12-month period. A presumption can be refuted by evidence on the contrary. Did Anderson's discovery of his condition in 1954 refute the presumption in his favor, and prevent his collecting? The court held that it did not. It noted that a progressive disease such as coronary sclerosis may be noticed years before it becomes disabling. To protect Anderson's rights, the court held that contraction of the disease was a legal concept rather than a medical one. It held that a worker legally contracts a disease when it affects his ability to fully perform his job. The court held Anderson did not become disabled until shortly before he left his job. The disease, therefore, was contracted within 12 months before it became disabling. Claim allowed. Anderson v. City of Minneapolis. Supreme Court of Minnesota, 103 N.W. 2d 397 (June 3, 1960). -- Occ. Hazards

113 He Smoked—Then Burned.

A man named Boggan worked for an employer whose business required extensive use of highly flammable substances. A strict rule prohibited any smoking by anyone in the building. Boggan entered a washroom and lighted a cigarette. He threw the match into the toilet bowl. The contents of the bowl exploded in flames. Boggan grabbed a bucket of sand to put out the fire. As he dumped the sand into the toilet, some of the flaming matter splashed onto him, injuring him. He said his attempt to squelch the flames was an act on his employer's behalf, and therefore part of his job. The court held otherwise. Lighting the cigarette was such a violation of his employer's orders that it amounted to a deviation from work and took him outside the scope of his employment. The court felt that instead of helping his employer by trying to extinguish the fire, he instead was merely trying to avoid detection by trying to undo what his original wrong had done. Claim denied. Boggan v. Abbey Finishing Company. New York Supreme Court, Appellate Division, 200 N.Y.S. 2d 488 (May 16, 1960). -- Occ. Hazards

114 The Board Lost.

A worker was burned to death in a butane gas explosion. He was never identified positively, because his body was too badly burned. For 2 years no one made any compensation claim. Texas statutes provide that in the event no survivors are entitled to compensation, the insurer must pay a certain sum into a general fund for the administration of the Workmen's Compensation Act. The Industrial Accident Board asked for this sum. The divided court held that mere absence of claimants was not enough proof there were no survivors entitled to benefits, and denied the Board's claim. A dissenting judge felt that since no one had made any claims, that alone should establish there were no survivors. Claim denied. Industrial Accident Board v. Texas Employer's Insurance Association. Texas Court of Appeals, 336 S.W. 2d 216 (June 1, 1960). -- Occ. Hazards

115 Silicosis—Injurious Exposure—Statutory Presumption.

The Board erred in placing upon the claimant the burden of proof of establishing that he had suffered an injurious exposure to silica dust within 2 years of the date of his disablement. It was undisputed that the claimant was totally disabled as the result of many years' exposure to silica dust. The court stated that the applicable statute specifically set out that any worker who had been exposed to the hazards of harmful dust for a period of at least 60 days subsequent to September 1, 1935 was presumed to have suffered an injurious exposure. Since there was no evidence to the contrary in the record, the court held that the claim had been erroneously dismissed. It was necessary to remand the case to determine whether 60 days' exposure had been suffered and which employer had been the last to employ the claimant under these conditions; the statutory burden of liability falls upon the last employer. Colombo v. Carideo. New York Supreme Court, Appellate Division, Third Judicial Department. No. 2341. July 12, 1960.

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116 Aggravation of Asthma from Exposure to Wool Dust.

The claimant was properly awarded compensation for an occupational disease because her disability was due to a work-caused aggravation of her asthmatic condition. The claimant worked for 29 years in a men's clothing firm where she came in contact with wool dust. About 2 years before her claim, she first experienced chest trouble from swimming in cold water. A year later she was out of work because of an asthmatic condition and she filed for compensation contending that her asthmatic condition was aggravated by wool dust. The Board found that her work precipitated the disabling bronchial asthma. The court held that an asthmatic condition was occupational in nature if work exposed the employee to irritants to which he was allergic. One doctor for the claimant testified that although the allergy may have developed because of repeated exposure, at the time of disability it was one of the substances to which she was allergic that definitely precipitated symptoms and caused manifestations of her disease. Another doctor for the claimant testified that even though the wool dust might not have made the disease worse, it aggravated the symptoms. Although the Board's decision on the occupational nature of the disability and the medical testimony was indefinite, there was sufficient clarity that the disability was due to aggravation of asthma so the finding was not remitted. Affirmed. Bichowsky v. Hickey Freeman Company. New York Supreme Court, Appellate Division, Third Judicial Department. No. 2176. July 27, 1960.

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## BOOKS, PAMPHLETS AND NOTICES

- 117 Occupational Diseases and Industrial Medicine. R. T. Johnstone and S. E. Miller. W. B. Saunders Company, West Washington Square, Philadelphia 5, Pa. 482 pp. (1960). \$12.

Since most of occupational illnesses are handled by general practitioners, this new book, the first of its kind in a decade, is of great value to today's physician. Burns, sprains and fractures no longer dominate the practice of industrial medicine. Today the emphasis is on the effects of chemical exposure, air pollution, radiation, emotional stress, absenteeism, insurance and disability problems. It is in these areas that the authors concentrate. Using the familiar clinical approach, etiology, signs and symptoms, pathology, physiology, diagnosis, treatment and follow-up care, the authors cover disorders ranging from chemical asphyxiation to injuries from excessive vibration. The book contains a practical method for estimating temporary or permanent disability; a wealth of case histories; a 15-page glossary of industrial terms to speed communications with the worker-patient and an exceptionally useful appendix on Threshold Limit Values for 1960 listing 373 common industrial gases, vapors, dusts, fumes and mists along with the concentration limit considered safe during an average working day.

- 118 Attorney's Fees in Workmen's Compensation. A Report of the Standards and Procedures in State Legislation. U. S. Department of Labor, Bureau of Labor Standards. Bulletin 220. 45 pp. (Sept. 1960). For sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 25 cents.

Injured workers are now afforded some measure of protection in 48 states, the District of Columbia, and Puerto Rico by regulations against excessive attorneys' fees in workmen's compensation cases, according to a study by the U. S. Department of Labor. The study points out, however, that "with numerous and varied amendments added to workmen's compensation laws at practically every legislative session and with the laws and court decisions becoming more technical, the promise of a workmen's compensation system intended to produce simple justice without litigation and without delays, is far from fulfillment." The Department's

Bureau of Labor Standards undertook the state-by-state study of standards and administrative procedures governing attorney's fees in workmen's compensation cases in response to a growing interest in the problem. The report, the first of its kind, provides an informational guide to legislators, administrators, attorneys, insurance carriers, representatives of labor and management, and others. It also includes a discussion of basic issues such as methods of regulating fees, amount of fees allowed claimants' attorneys, adding fees to the award, methods of reducing costs to claimants, safeguarding claimants against unfair practices, and the extent to which lay persons can represent claimants. An appendix includes brief summaries of state statutory provisions, rules, and operating policies. There are also tabular listings of major statutory provisions.

- 119 Health Statistics from the U. S. National Health Survey. Series B-No. 24. Acute Conditions, Seasonal Variations. United States July 1957 - June 1960. U. S. Department of Health, Education, and Welfare, Public Health Service. PHS Publication No. 584-B24. 47 pp. (Nov. 1960). For sale by Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. 35 cents.

During the period July 1957 - June 1960, there were an estimated 1,161.0 million acute conditions—an average of 6.8 million conditions for each person in the United States. Some 125.6 million of these were infectious and parasitic diseases; 707.8 million, respiratory conditions; 63.0 million, conditions affecting the digestive system; and 142.8 million, injuries. There were also 121.9 million other acute conditions such as deliveries and complications of pregnancies, skin conditions, ear diseases, and other acute conditions with relatively low incidence. There was a marked seasonal variation in the incidence of acute conditions. During this period only 16.6% of the acute conditions occurred in the July-September quarters, 29.8% in October-December, 32.2% in January-March, and 21.4% in April-June. The impact of the Asian influenza epidemic is quite apparent in the winter of 1957 - 1958. In October-December 1957 there were 75.2 acute respiratory conditions per 100 persons, and in January-March 1958 there were 52.6 acute respiratory conditions per 100 persons. However, even in the non-epidemic years there was an obvious seasonal pattern in the incidence of respiratory conditions which usually had their highest incidence in January-March and the lowest in July-September. There is no indication of a seasonal pattern in the conditions related to the digestive system and there are too many different kinds of conditions in the "all other" category to permit discussion of it as a unit.

- 120 Health Statistics from the U. S. National Health Survey. Series B-No. 26. Interim Report on Health Insurance. United States July-December 1959. U. S. Department of Health, Education, and Welfare, Public Health Service. PHS Publication No. 584-B26. 67 pp. (Dec. 1960). For sale by Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. 45 cents.

Approximately 67% of the civilian non-institutional population of the United States was covered by some form of hospital insurance, 62% by surgical insurance, and 19% by insurance for doctor visits outside the hospital according to responses to 19,000 household interviews conducted by the U. S. National Health Survey from July through December 1959. In urban areas 72% of the population had hospital insurance; in rural-non-farm areas 68% had hospital insurance; in farm areas 45% had this kind of coverage. For surgical insurance the comparable estimates were 66, 64, and 40%, and for doctor visit insurance the estimates were 20, 21, and 12%. The proportion of the population covered by hospital and surgical insurance was generally highest in the Northeast and North Central regions of the United States and lowest in the South. The proportion covered in the West was between the extremes and somewhat below the national average. However, the proportion covered by insurance for doctor visits in the West, 32%, was higher than in the other 3 regions. In families where the income during the previous 12 months was under \$2,000, approximately 33% of the persons had hospital insurance, 27% had surgical insurance, and 9% had insurance for doctor visits outside the hospital. In families with the highest income during the previous 12 months, \$7,000 or more, the comparable percentages were 84, 80, and 28. Among persons aged 65 and older, approximately 46% were covered by some form of hospital insurance, 37% by surgical insurance, and 10% by doctor visit insurance.

## INDUSTRIAL MEDICAL PRACTICE

NHB-0018757

- 121 A Clinical Survey of a Cross-Section of an Industrial Worker Group. R. E. Birk.  
Arch. Environmental Health 1, 291-296 (Oct. 1960).

A periodic health survey, utilizing symptoms and signs as a determining factor for evaluation, of 400 supposedly well patients from a heterogeneous group is described. The yield in terms of treatable disease is high and compares favorably with more extensive evaluations. The cost of such examinations and the expenditure in physicians' time are within reasonable limits, making this type of evaluation worth considering as a means of dealing with large groups.  
-- Author's summary

- 122 Mental Health and the Worker. S. Greenhill. J. Occ. Med. 2, 576-578 (Dec. 1960).

Most human factors affecting mental health and productivity will not be found clustered around the work place. They will, instead, be found in diverse and unsuspected spots along the road from infancy to adulthood. A few hints are given as to the most likely spots where these factors may be found.  
-- Author's conclusion

- 123 The Early Recognition of Behavioral Disturbances. R. W. Waggoner.  
Ind. Med. & Surg. 29, 465-469 (Oct. 1960).

Although this discussion was to have been primarily focused on the recognition of behavior difficulties, that is, early mental disease, it seems that much can be learned from military experience with regard to other related factors involved in the occurrence of mental disease in industrial personnel. An attempt has been made to correlate some of these factors. The author ends his paper with a quotation from Oliver Wendell Holmes: "Emphasis on the obvious is often more important than elucidation of the obscure."  
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- 124 Incidence of Vasopastic Disturbances of Hands in Miners. B. Anda.  
Nord. Hyg. Tidskr. 41, 123-147 (1960).

One hundred eighteen miners exposed to vibrations from pneumatic tools at the Sulitejelma copper mines in Norway have been examined with regard to "white fingers". Seventy-one out of 85 drillers operating drills with 3,000 to 4,000 vibrations per minute had "white fingers". The average time of exposure before onset of symptoms was 5 years. X-ray examinations revealed pathologic changes in bones and joints of the hands in 37 cases; in addition traumatic osteoarthritis in the elbow (6 cases) and in the shoulder (1 case). On the basis of their complaints and especially of the results of the clinical examinations, the subjects have been classified into 4 groups, Normal: 14. Stadium I: 35. Stadium II: 17. Stadium III: 19. Examinations of the remaining 33 miners showed that 32 had "white fingers", 21 of them had at an earlier period of time been exposed to work with pneumatic tools as drillers. Prophylactic measures are discussed.  
-- Bull. Hyg.

- 125 Findings of X-Ray Examination of the Bones and Joints of Workers with Pneumatic Tools. G. Bittersohl. Arch. Gewerbepathol. Gewerbehyg. 17, 597-617 (1960). German.

A discussion of the literature on the nature and mechanism of causation of damage to the bones and joints of workers with pneumatic tools introduces the findings of routine x-ray examinations carried out on 486 such workers. These workers were: (1) Boiler makers and steel workers. (2) Building workers. (3) Miners. Particulars are given of the different

types of pneumatic tool used by these groups of workers, the age distribution of these men, the number of years of their employment and the daily hours of work. X-ray examination was restricted to the hand, elbow and shoulder joints. The findings in pneumatic tool workers were compared with those in a control group of men. The main conclusion is that in 13% of the workers there was evidence of damage caused by the use of pneumatic tools. Of this percentage 10.9% were osteomalacia of the semilunar bone and 0.4% of pseudarthrosis of the navicular. Among boiler and steel workers and the building workers damage to the elbow joint was common whereas in miners the damage was almost entirely restricted to the small bones of the hand in the form of cyst formation.

-- Cond. from Bull. Hyg.

- 126 The Formation of Occupational Cataract. J. Borneff and G. Barthelmess.  
Z. Hyg. Infektionskrankh. 146, 414-424 (1960). German.

This paper is based on the examination of 10 human lenses, the degree of opacity of which had been clinically determined before they were surgically removed for a variety of conditions. The lenses were examined against air and against water by spectrophotometer (Zeiss-Spektralphotometer PMQII-wave length range 600-2,500 millimicrons). The results were that absorption of ultra-red rays is determined by the water content of the lens, for water-free lens constituents are more permeable to these rays than water. Special reactions in the lens fibers to radiation are therefore unlikely. These findings taken in conjunction with those of other authors point to the conclusion that occupational cataract is to be regarded as a disturbance of the development of the germinal lens epithelium caused by damage to the equatorial zone.

-- Cond. from Bull. Hyg.

- 127 Asthmatic Factors in Chest Complaints of Miners. K. DeVries, N. G. M. Orie and A. V. M. Mey. Acta Med. Scand. 167, 301-308 (July 15, 1960).

The disproportion between the symptoms and the radiological findings in miners with chest complaints suggests that another factor is involved. This factor may be an asthmatic disposition evidenced by various symptoms which have common features such as familial incidence, eosinophil cells in the blood, bronchospasm, etc. A hereditary mechanism of this type could be used to distinguish between chest complaints of miners with asthmatic predisposition and those due to dust. School children in an area in the Netherlands who had this asthmatic predisposition as evidenced by slight or severe asthma or chronic relapsing bronchitis were selected and a comparison group taken from their schoolmates. The male family relatives were traced and those who were miners were studied as regards chest complaints, x-ray findings, etc. It was found that the number of days of disability due to dyspnea or other chest conditions was greater in the asthmatic group than in the control group. It was also higher in the underground workers than in the surface workers. There is therefore an additional factor inherent in working in an underground environment. No significant difference was found in the radiological findings.

-- Bull. Hyg.

- 128 The Cardiac Patient in Industry. E. A. S. Reid.  
Can. Med. Assn. J. 83, 1007-1011 (Nov. 5, 1960).

The author gives a sketchy review of how a cardiologist looks at the cardiac patient in industry. Knowledge of the causes and care of the cardiac patient is still inadequate. The ability to pick out patients who may develop cardiac disease is admittedly limited. Some are very pessimistic about the treatment of cardiac disease, especially those in the coronary group. The author feels that this pessimism is greatly exaggerated. A patient who is carefully treated during his acute stage and then carefully watched and guided can usually return to a full and happy life. Granted, cures are few and far between, but the patient can still have an active and enjoyable existence. Cardiac surgery has opened up new vistas, but the most lasting approach is research into the cause of these diseases. The industrial physician can play a very important part. He is in an excellent position to document the natural history of these diseases, which still needs a great deal more study. He is also in a position to detect disease in its early stages and institute prophylactic measures. It is he who enables the cardiac patient to carry on with the job and continue to make his contribution to society.

-- Author's summary

- 129 Treatment of Coronary Atherosclerosis with Linetole. P. E. Lubomsky, V. I. Bobkova and P. M. Savenkov. *Klinicheskaya Meditsina* No. 8, 68 (1960). Russian.

Linetole is a preparation consisting of ethyl esters of linoleic and linolic acids in the same proportions as these fatty acids are found in linseed oil. It has been prepared by the Soviet Drug Industry at the request of the authors. A daily dose of 20 ml. was given for 20 days to 50 patients with known coronary atherosclerosis. In 10 patients it was used over longer periods of time. During the administration of this agent the cholesterol and beta-lipo-protein levels in the serum dropped and in the intervals when the administration of Linetole was discontinued these rose gradually again. Patients noticed marked improvement in their general well-being and a decrease in anginal symptoms. -- Can. Med. Assn. J. Absts.

- 130 Verrucous Carcinoma of the Buccal Mucosa in Tobacco Chewers. K. Sorger and J. A. Myrden. *Can. Med. Assn. J.* 83, 1413-1417 (Dec. 31, 1960).

Squamous cell carcinoma is the most common malignant neoplasm affecting the oral mucosa. Such tumors may present considerable histological variation, but the majority are only moderately well differentiated. They are frequently preceded by leukoplakia. Syphilis, dental irritation, smoking and the Plummer-Vinson syndrome are recognized as factors which probably predispose to oral cancer. More specially, in carcinomas of the buccal mucosa the chewing of betel nuts as practiced in many countries of the Far East, and of tobacco including snuffs is considered to be an important predisposing factor. In the great majority of patients with this verrucous type of squamous carcinoma a history of tobacco chewing could be obtained. The present report deals with 4 such cases of verrucous carcinoma of the buccal mucosa which were encountered in old men with a longstanding history of tobacco chewing. In view of the fact that this variety of oral cancer carries a much better prognosis than the more usual squamous cell carcinomas of the mouth and since a 1- to 7-year follow-up is available in 3 of the 4 cases, it would seem to be justified to draw further attention to this lesion. The need for awareness of this entity and for its separation from the usual type of squamous carcinoma of the mouth is emphasized. -- Can. Med. Assn. J.

- 131 Immunization, Antibiotics and Surgery in Wound Management. O. P. Hampton, Jr. *Ind. Med. & Surg.* 29, 553-555 (Dec. 1960).

Precise and thorough wound surgery remains the most important preventive measure against all forms of wound infection including tetanus, gas gangrene and pyogenic wound infection. Only against tetanus are biological products effective in producing some immunity. Active immunization with tetanus toxoid is far more valuable as a preventive measure than passive immunization with tetanus antitoxin. Antibiotics may be valuable at times in preventing wound infection of all kinds but only as an adjuvant to other measures.

-- Author's summary

- 132 The Efficiency of an Ethylene Oxide Sterilizer in Hospital Practice. R. Znamirowski, Sheila McDonald and T. E. Roy. *Can. Med. Assn. J.* 83, 1004-1006 (Nov. 5, 1960).

Dried preparations of *Staphylococcus pyogenes* and spores of *Bacillus cereus* were used to test the efficiency of an ethylene oxide sterilizer. When used according to the manufacturer's instructions, exposure for 2 hours at a temperature of 130°F with 2 cans of gas giving a pressure of 12 lb. and with 30 ml. of water in the reservoir, the machine failed to sterilize micro-organisms dried on glass. Some staphylococci dried on glass survived treatment for 6 hours and spores of *B. cereus* on glass survived 18 hours. Sterilization was remarkably better when the bacteria were dried on absorbent paper. Future improvements in the design of machines, especially for the control and application of humidity, may lead to effective ethylene oxide sterilizers for practical use in hospitals. -- Authors' summary

## SKIN DISEASES AND BURNS

- 133 Contact Dermatitis due to Gold. M. A. Cowan. Brit. J. Dermatol. 72, 348 (1960).

A case is described of contact dermatitis due to allergic sensitivity to gold with confirmatory positive patch tests. -- Can. Med. Assn. J. Absts.

- 134 Dihydroxyacetone. P. B. Mumford. Brit. J. Dermatol. 72, 279 (July 1960).

The active agent in cosmetic preparations designed to "tan" the skin is reported to be dihydroxyacetone, a white crystalline powder soluble in 1 part of water and 15 parts of alcohol. Although the exact chemical nature of the color reaction is uncertain; it is probable that a compound is formed by one of the hydroxyl radicals of dihydroxyacetone with amino acids in the superficial layers of keratin, followed by complex polymerization resulting in production of a brown pigment in several hours. The pigment is not melanin. The author describes his experiences with an experimental formula containing 2.5% dihydroxyacetone, 2.5% glycerin, 33% methylated spirits, and water to 100. He was unimpressed with the cosmetic results obtained. Moreover, the pigment formed did not diminish the response to ultraviolet radiation. On the skin of 32 normal and 10 eczematous persons, there were no evidences of irritation or complaint of local discomfort. -- J. Occ. Med. Absts.

- 135 Boxing Gloves in Dermatology. E. R. Gross. A.M.A. Arch. Dermatol. 82, 266 (Aug. 1960).

This article calls attention to a simple, socially acceptable, inexpensive, mechanical deterrent to nocturnal excoriation. As a part of the selling program, the author keeps a set of boxing gloves in his office and loans a pair to the itching patient for one week when indicated. He has found there is no hesitancy about purchasing a pair if this therapeutic measure proves effective. NOTE: Scratching at night, whether conscious or unconscious, is one of the primary factors responsible for the perpetuation of pruritic "neurodermatoses". -- J. Occ. Med. Absts.

- 136 The Inadequacy of Dermabrasion in the Therapy of Nevi. C. Mopper and E. S. Mercantini. Can. Med. Assn. J. 83, 1015-1016 (Nov. 5, 1960).

It is a well-accepted fact that surgical skin planing, in the treatment of acne scarring and other cosmetic defects, is a useful tool in the hands of the experienced operator. However, the treatment of nevi by this method has produced varied results and varied opinions as to its merits. As removal of extensive disfiguring pigmented lesions of the skin by excision and grafting often results in more disfigurement than the original condition the authors employed dermabrasion in 3 patients with pigmented nevi. They conclude that dermabrasion has proved inadequate therapy in the treatment of the types of nevi reported in these 3 cases. A review of the literature on planing of nevi is presented, along with the authors' results and conclusions in the treatment of these 3 cases.

- 137 Further Observations on Late Radiation Necrosis Following Therapy of Skin Cancer. H. L. Traenkle and D. Mulay. A.M.A. Arch. Dermatol. 81, 908 (1960).

In regard to the complication of late radiation necrosis, a series of 816 patients with skin cancer, treated with daily fractions of 500 r, 400 r, and 300 r have been compared with a previously reported series of 935 patients who had received 100 r fractions. When calculated by the life-table technique over a 4 1/2-year period, the probability of developing late necrosis in the present series of cases treated with smaller fractions is less than 3% as contrasted with almost 14% in the previously reported series. -- Can. Med. Assn. J. Absts.

- 138 Curettage and Electrodesiccation in the Treatment of Skin Cancer. J. M. Knox, T. W. Lyles, E. M. Shapiro and R. D. Martin. *A.M.A. Arch. Dermatol.* 82, 197 (Aug. 1960).

The authors present the case for curettage and electrodesiccation in the treatment of skin cancer. An evaluation is presented of the results obtained in 345 patients with 765 epitheliomas of the basal- and squamous-cell types which were treated by curettage and electrodesiccation. In the group followed for 5 years or longer, the cure rate was 96.7%. The cure rate for all 765 lesions was 98.3%. In the latter analysis, maximum follow-up was 19 years and minimal 6 months. Recurrences were not a problem, and no metastases or deaths were noted. Curettage and electrodesiccation would thus seem to provide an efficient, practical, controllable, cosmetically satisfactory modality for the treatment of skin cancer.

-- J. Occ. Med. Absts.

#### CHEMICAL HAZARDS

- 139 The Epidemiology of Accidental Poisoning in an Urban Population. (2) Prevalence and Distribution of Poisoning. P. F. Wehrle, et al. *Am. J. Public Health* 50, 1925-1933 (Dec. 1960).

The occurrence of accidental poisoning in a random sample of 1,069 households in Syracuse, New York, was studied. Similar rates of poisoning were observed in all socio-economic areas. The majority of the poisoning episodes occurred among young children. Nearly 12% of children 2 years of age had experienced an episode within the 12 months prior to the study. In families of 5 or more members 6.5% of families had experienced accidental poisoning in at least one member within the previous year and 23% of these larger families had a history of poisoning at sometime in the past. Only 76% of these episodes had the benefit of consultation with a physician. This seems due primarily to a lack of awareness of the potential hazard of aspirin and some of the common household products. Lack of awareness of the potential hazard of household medicines and other substances was common. The related observation that the substance ingested was seldom in its proper (and inaccessible) place was made. Although these observations do not offer a panacea for this problem, they serve to emphasize the need for continued education of parents during routine health supervision as children enter the danger age of 1 to 4 years. Safety caps and safe storage places for medicine and household products offer at least a partial solution to the problem.

-- Authors' summary

- 140 Colorimetric Method for Continuous Recording Analysis of Atmospheric Fluoride. Test Chamber and Interference Studies with the Mini-Adak Analyzer. D. F. Adams, R. K. Koppe and N. E. Matzek. *Anal. Chem.* 33, 117-119 (Jan. 1961).

Automatic continuous measurement and recording of the variations in concentration of fluorides in the ambient air has been reported recently using the Mini-Adak atmospheric pollution analyzer. A low fluoride reagent, micrograms per cubic meter or parts per billion atmospheric concentration range, consisting of a zirconium-Eriochrome Cyanine R complex, is incorporated in the method. This paper delimits the tolerance of this reagent to a number of common gaseous and particulate atmospheric pollutants which might be concomitantly present with fluoride in an air sample. Los Angeles smog-type gases appear to be compatible with the reagent. The reagent may be subject to interference from phosphate, sulfate, and aluminum. However, phosphate appears to offer the only significant source of error under typical field sampling conditions. The Mini-Adak analyzer, with the low fluoride reagent has an approximate 18% analysis efficiency for submicron cryolite.

-- Authors' summary

03120743



- 141 Toxicological Studies on Hydrocarbons—(7). A Gravimetric Method for the Determination of Inorganic and Ethereal Sulfate in Urine. H. W. Gerarde.  
*Am. Ind. Hyg. Assn. J.* 21, 511-514 (Dec. 1960).

A rapid simplified gravimetric method has been described for the determination of inorganic and total sulfates in urine. The procedure is suggested as a clinical method for the determination of the urinary sulfate ratio. The analysis can be carried out by a technician in the clinical laboratory since it does not require specialized equipment of the analytical laboratory or the skills and experience of the analytical chemist. A new rapid quantitative self-regulating pressure filtration technique has been developed for this procedure which may find wider application in analytical work in which filtration is required.

-- Author's summary

- 142 Safeguards for Work with Aluminum Alkyl Compounds. J. Kroger.  
*Zentr. Arbeitsmed. u. Arbeitsschutz* 10, 101-103 (May 1960). German.

Aluminum alkyl compounds are being used in industry to an increasing extent, and their most important application is as catalysts in the production of polyethylene. Other uses which have been described are in the refining of aluminum, the production of tetraethyl lead and the synthesis of primary alcohols. This paper contains an account of the chemistry involved in the production of aluminum tri-ethyl and of the chemical reactions of this and other alkyl compounds. In strong solution these compounds are very corrosive to the skin and inhalation of their vapors may cause bronchial irritation. The fumes are perceptible in an atmosphere even in low concentration as they are white in color from the aluminum oxide they contain and in addition have a strong, musty odor. There is a long description of the essential safeguards to be taken for the workers which are based on the chemical character and high reactivity of these aluminum compounds. These precautions may include the use of masks and protective clothing and against fire, and adequate ventilation. Great care is also needed in the manufacture of the alkyl compounds since they are made under high pressure. Contact of the compounds with water must be avoided and for transport special containers are essential. These containers are filled and emptied in an atmosphere of dry nitrogen. Even small amounts of the compounds should be stored under a dry inert gas such as nitrogen or argon.

-- Bull. Hyg.

- 143 The Collection and Determination of Chromium in an Urban Atmosphere. S. M. Belth, E. Kaplan and C. E. Couchman. *Arch. Environmental Health* 1, 311-315 (Oct. 1960).

A method is described for the detection and measurement of microgram quantities of chromium in large numbers of atmospheric dust samples collected on filter paper tape. The method was applied to a study of chromium in an urban atmosphere.

-- Authors' summary

- 144 Chronic Mercurial Intoxication. A Review. Frances E. Noe.  
*Ind. Med. & Surg.* 29, 559-564 (Dec. 1960).

A review of the sources, pathogenesis, symptoms, physical findings, and chronic mercury toxicity has been presented. Prevention and control of exposure to mercury in laboratories and work areas has been described, with particular emphasis on technique for handling of the free metal, based on the findings of several studies of chronic mercurialism conducted in industrial and scientific laboratories. The bibliography contains 41 references.

-- Author's summary

- 145 Determination of Mercury in Blood. M. B. Jacobs, S. Yamaguchi, L. J. Goldwater and H. Gilbert. *Am. Ind. Hyg. Assn. J.* 21, 475-480 (Dec. 1960).

A method for the ultramicro-determination of mercury in blood has been presented. It depends upon a cold digestion of the blood with potassium permanganate and sulfuric acid,

separation of the mercury by a dithizone extraction, liberation of mercury vapor by the destructive distillation of the mercury dithizonate, and estimation of the mercury by use of an ultraviolet light mercury vapor meter. Only one milliliter of blood is required for a determination. The method is suitable for the milli- and centi-microgram range, that is, for  $10^{-8}$  to  $10^{-9}$  gram of mercury. -- Authors' summary

146 Extraction and Flame Spectrophotometric Estimation of Thallium in Urine.

W. B. Stavinocha and J. B. Nash. Anal. Chem. 32, 1695-1697 (Nov. 1960).

An assay of thallium in urine by flame spectrophotometry by use of an organic solvent extraction with 2-octanone has been developed. After wet ashing of the urine sample, thallium is extracted with 2-octanone from a 1 M hydrobromic acid solution. The 2-octanone is then washed with hydrobromic acid solution (1 M) and aspirated directly into the flame. Known amounts of thallium added to urine samples were recovered satisfactorily by this method. -- Authors' abstr.

147 Survey of Lead Hazard in Indoor Firing Ranges. C. R. Ross, J. P. Windish, L. DuBois, J. L. Monkman and A. J. DeVilliers. Am. Ind. Hyg. Assn. J. 21, 256-260 (June 1960).

Air-borne lead in firing ranges is generated in 3 ways: by combustion of the lead compounds usually found in priming compositions, by abrasion of the bullet when it leaves the gun, and by fragmentation of the bullet when it strikes the target or backstop. High air-borne lead concentrations were found and studies of the lead hazard were made at 6 ranges. As a result of the findings an environmental survey was carried out. The survey consisted of the measurement of air concentrations of lead during firing practice, analysis of settled dust samples for lead, and ventilation measurements. Lead analyses of air samples were made by a polarographic technique. Urine samples were analyzed by a modification of one of the dithizone methods. -- APCA Abstrs.

148 Tetraethyl Lead Poisoning Incident with Eight Deaths. E. E. Morrill.

Am. Ind. Hyg. Assn. J. 21, 515-517 (Dec. 1960).

This paper concerns a tetraethyl lead poisoning incident at the U. S. Army Koshiba POL (Petroleum, Oils and Lubricants) Terminal near Yokohama, Japan. A private company under contract for the cleaning of several petroleum tanks had 23 of its employees enter various Japanese hospitals between August 23 and September 10, 1958 following the completion of cleaning a tank which contained 115/145 aviation (leaded) gasoline. During the period August 26 to September 3, 1958, 8 of these persons died, including the contractor. This tragic accident did not come about because of the lack of adequate means for protection, but primarily because of the lack of constant and competent supervision which must be provided at all times for tank cleaning work of this nature. Other similar incidents in the military services during the past few years where there have been fatalities, near-fatalities, and serious illnesses from tetraethyl lead exposures make competent supervision mandatory for these operations.

149 A New Spectrophotometric Procedure for the Microdetermination of Methyl Chloride.

Margaret Redford-Ellis and J. E. Kench. Anal. Chem. 32, 1803-1807 (Dec. 1960).

Micro-amounts of methyl chloride are determined by spectrophotometric procedure based on the Fujiwara reaction for chloroform. The method is sensitive but not specific, all alkyl halides react. Methyl chloride indicates a maximum absorption peak at 365 millimicrons. Other alkyl halides give single peak between 360 and 375 millimicrons. -- AC Briefs

- 150 Observations on the Toxicity of Triarylphosphates. D. Henschler.  
Zentr. Arbeitsmed. u. Arbeitsschutz. 10, 86-88 (Apr. 1960). German.

Triarylphosphates are essential for many technical purposes. The most frequently used type of preparation was at one time tricresylphosphate containing about 30% of o-cresol which in Germany caused many cases of irreversible paralysis particularly in the war and post-war periods. Much less toxic preparations of lower o-cresol content have now been introduced. For many purposes triarylphosphates in which cresol is more or less replaced by a homologous group can be used. The author, who has published observations on the toxicity of these preparations, discusses the relation between chemical configuration and toxicity and reports the results of some experiments on hens with a number of different aryl phosphates to determine the single dose which would induce signs of paralysis. Preparations tested were 2 tricresylphosphates (1 containing 26.7% and the other 3.3% o-cresol), 2 diphenylmonocresylphosphates, a diphenylmonoxylenephosphate and a product called a technical xylenol mixture. The last of these which contains 21.8% of 3,4-xylenol, 32.8% of 3,5-xylenol, and small amounts of o-cresol (1.6%) and phenol (0.7%) was found to have a very low toxicity as compared with that of the other tested preparations. It is considered that there is practically no danger of poisoning in using this material.

-- Bull. Hyg.

- 151 The Moroccan Poisoning of 1959: Tricresylphosphate Myelopolyneuritis. H. Geoffroy, P. Pascal, A. Slomic and M. Bénébadji. Presse med. 68, 1474 (1960).

Ingestion of oil containing tricresylphosphate affected 10,000 victims in Morocco in the months of September and October 1959. Clinically the intoxication affected mainly the pyramidal tracts of the spinal cord but involved sensory fibers as well. The authors report the results of clinical, biological and electromyographic studies on a large number of these patients. Of particular interest among the laboratory investigations was the behavior of the serum cholinesterase activity which was markedly decreased on admission and showed a gradual rise subsequently. The accidental discovery of immediate improvement in motor paralysis following an injection of pilocarpine in one case prompted the treatment of 40 other patients by this drug. Clinical and electromyographic improvement was consistently observed in these patients but it was of short duration. No other form of treatment was associated with any demonstrable benefit. Various vitamins, singly and in combination, corticosteroids and atropine were ineffective, as were eserine, prostigmine and other drugs with an anticholinesterase action. It is anticipated that the finding of clinical, electrical and laboratory improvement following the administration of pilocarpine hydrochloride may lead to a better understanding of the mechanism of damage by tricresylphosphate.

-- Can. Med. Assn. J. Absts.

#### INDUSTRIAL DUSTS

- 152 A Simple Mathematical Method for Evaluation of Data from Droplet Counts on Settling and Impaction Slides. A. Pfeiffer. Am. Ind. Hyg. Assn. J. 21, 526-528 (Dec. 1960).

Despite the development of a variety of instruments for assessing the sizes of droplets suspended in aerosol and spray clouds, a large amount of work is done currently by manually counting and sizing droplet images. Whether the images are produced by the light microscope, by projection of photomicrographs or droplet patterns on transparent slides onto screens, the investigator must adopt a uniform method for the evaluation of the data he gathers. This paper describes a simple mathematical method which may be used for this purpose.

03120746

- 153 A Miniature Electrostatic Precipitator for Sampling Aerosols. Theory and Operation. M. Robinson. Anal. Chem. 33, 109-113 (Jan. 1961).

Equations are derived describing the performance of a miniature electrostatic precipitator used for sampling aerosols, the particles of which may be considered charged exclusively by ion bombardment. Paying particular attention to the time required for the changing process, criteria are developed for judging the effectiveness with which a wet precipitator will concentrate the non-gaseous constitute of an aerosol. The theory is tested experimentally. -- Author's summary

- 154 Particle Size Analysis with the Slit Ultramicroscope. J. Olaf. Staub 20, 180-183 (June 1, 1960). German.

The counting of aerosols particles with the slit ultramicroscope is inaccurate for 2 reasons: first the illuminated volume within which particles are counted is difficult to define, and secondly the amount of light scattered by small particles is so much less than that originating from large ones that it is difficult to arrive at a suitable compromise for the intensity of illumination. The apparatus described uses comparative counts of the same field, over a succession of time intervals during which the larger particles disappear by sedimentation, so that the above 2 errors are minimized and a size distribution, not an absolute particle count, is obtained. An intense horizontal illuminating beam is used with a lens forming an image of a horizontal slit in the observation chamber. This is viewed vertically and photographed at intervals over half an hour; the illuminated zone measuring, in plan, 0.5 x 6 mm. and being magnified 6 times on the photographic film. The negative after development is enlarged a further 10 times and counted by projection. The dust is drawn into the observation chamber which must be free from convection currents during the period over which photographs are being taken; it is possible that the rather large scatter in the counts was due to insufficient attention to this point which is not mentioned. The advantage of the method is that the particles are always in the original air-borne state. High-sensitivity photographic material is necessary and a good processing technique. -- Bull. Hyg.

- 155 Evaluation of an Aerosol Photometer for Dust Counting and Sizing. A. D. Hosey, H. H. Jones and H. E. Ayer. Am. Ind. Hyg. Assn. J. 21, 491-501 (Dec. 1960).

A portable light scattering photometer is described and preliminary data are presented to show comparative results of measurements of dust concentrations using this instrument and the impinger sampling and counting technique. Results of preliminary laboratory tests on 6 types of dust indicate that this aerosol photometer with proper adjustment can be used with the same degree of accuracy as the impinger technique. Furthermore, particle size distribution curves prepared from data using the aerosol photometer and the membrane filter method, while not always parallel, are in good agreement at the median size and check quite closely for about 70% of the particles, i.e., from about 15% to 85%. This instrument has several other features which are useful to industrial hygienists and others. No extensive field tests have been made using this instrument. It has been useful in studies conducted in a nuclear submarine, in so-called "clean rooms" at a large aircraft plant, in a steel mill, and at a plant involving bagasse dust. The present model of this instrument has a few minor objectionable and troublesome features which can be rectified in future models. The aerosol photometer is not commercially available but one manufacturer is considering production and may have a prototype available within the next 2 years. -- Cond. from authors' summary

- 156 Experiences with Phase Microscopy. M. Sheinbaum. Am. Ind. Hyg. Assn. J. 21, 518-521 (Dec. 1960).

The adaptation of the phase microscope to industrial hygiene techniques is of value in reducing eye strain and increasing clarity of vision while making dust counts and particle size analyses. Longer working periods with increased accuracy are practicable. It is of considerable value in determining with relative speed the quartzite concentrations in the parent

material and in making similar determinations on air samples. The major difficulties experienced lie in the need for delicate microscope adjustments and in the preparation of microscopic samples from air samples collected in isopropyl alcohol. -- Author's conclusions

- 157 Silicosis of the Bone Marrow. J. L. Nicod and D. Gardiol.  
Arch. Gewerbepathol. Gewerbehyg. 18, 79-90 (1960). French.

Silica dust in the lung produces lesions which always start as an accumulation of histiocytes round little blood vessels. Some particles are carried via the reticuloendothelial system, to other organs, and such particles retain their pathogenicity. The presence of silicotic nodules in the liver and spleen is a common finding in the silicosis of miners and industrial workers in Switzerland, but the presence of silicotic changes in the bone marrow has not so far been clearly demonstrated. The authors think that the reason for this is that the morphological study has not been sufficiently complete. They have therefore examined the vertebral and femoral bone marrow from all silicotic cases examined post-mortem over a period of years, and have traced the progress of lesions caused by silica. The first reaction is an accumulation of histiocytes, at first fluffy, then more discrete. Silver staining shows up a close meshed network of fibers. Although such lesions become more sharply defined they for the most part do not progress further. At this stage they are indistinguishable from those produced by infections such as tuberculosis. That is why they have been ignored by others interested in silicosis. It is concluded that the presence of silicotic nodules in the bone marrow shows that silica retains its toxicity even when it leaves the lung. Silicotic lesions should therefore be found in still more organs. Finally, a morphological study does not give any lead as regards functional damage. -- Cond. from Bull. Hyg.

- 158 Serum Lipoprotein and Protein Content in Silicosis. H. Valentin, N. Lichius and G. Zerlett.  
Arch. Gewerbepathol. Gewerbehyg. 17, 227-237 (1959). German.

The authors made a detailed study of the serum protein and serum lipoprotein electrophoretic patterns of 56 silicotic patients. The results confirmed those of previous workers in that serum albumin was in the main decreased whereas gamma-globulin was increased; lipid fraction I levels were on the whole lower than those found in healthy subjects. There was no relation of serum lipoprotein content to grade of severity of silicosis. -- Bull. Hyg.

- 159 The Varieties of Asbestos, their Study by Optical Methods and their Pathogenic Action.  
K. G. Schmidt. Staub 20, 173-180 (June 1, 1960). German.

Asbestos is usually classified rather unscientifically by the characteristics which make it technically useful, by its place of origin, its color and so on. With modern methods, however, including an elaborate microscopical technique, 11 well-defined varieties of asbestos can be distinguished, the most important of which are chrysolite, amosite, crocidolite, tremolite and anthophyllite. In discussing the pathogenic action, the author states that asbestos may possibly undergo changes in the lung. However, it is doubtful how far the different varieties can be recognized in the lung dust. In speaking of the formation of asbestos bodies as a reaction intended to get rid of asbestos in the lung, he suggests that varieties susceptible to chemicals will form these readily. Chrysolite and possibly amosite may do so rather than the kinds of asbestos which are very resistant. Warning is given that the formation of bodies is not necessarily a disease. A considerable controversy has raged over the question as to whether chrysolite or hornblend is capable of producing bodies in the lungs. The literature as regards this and also the question of the action of short-fibered asbestos is reviewed. All forms of asbestos must be regarded as dangerous. It is suggested that chrysolite, crocidolite, and amosite have long, yielding fibers which can penetrate the lung more easily than the stiff brittle fibers of tremolite and anthophyllite. This would produce mechanical damage; chemical effects might result from the more sensitive chrysolite and amosite. The iron and aluminum content of the different types may also influence the pathogenic action. -- Cond. from Bull. Hyg.

03120748

- 160 The Pathological Anatomy of Talc Lungs. H. A. Müller.  
Arch. Gewerbepathol. Gewerbehyg. 17, 262-282 (1959). German.

The author describes in detail the macroscopic and histological appearances of talc lesions in the lungs of 2 men. Both had been exposed for many years to talc dust in the same gum factory. The specimen from the first case was provided by surgical biopsy during thoracotomy and that from the second by lobectomy performed to remove a drug-resistant cavitated tuberculous lesion. With minor exceptions, the talc lesions from both patients showed the characteristic features of talc granulomata as described by Schepers and Durkan.

-- Bull. Hyg.

- 161 Influence of Mine Dust on the Development of Chronic Asthmatic Bronchitis.  
M. Navratil. Arch. Gewerbepathol. Gewerbehyg. 17, 618-626 (1960). German.

One hundred and nine iron ore miners who had worked for more than 10 years underground were studied clinically and physiologically, by measuring the Forced Expiratory Volume (FEV) and by pneumotachography. Comparison of the pneumotachograph results in 24 patients with asthmatic bronchitis and 29 normal controls showed that the miners agreed closely with the normal controls but differed significantly from the patients. Ninety-five of the miners were examined again after a shift underground. Signs of bronchitis (increased expiration and dry rhonchi) were heard in twice as many men as on the previous occasion. The vital capacity was higher in 32, lower in 10 and the same in 53 of the men; while the FEV was higher in 8, lower in 46 and the same in 41. The author concludes that these studies do not support a bronchospastic influence of dust; but that they indicate that dust induces an irritative bronchitis. The conclusions apply only to iron ore miners. Further studies on these lines are at present being carried out in coal workers.

-- Cond. from Bull. Hyg.

- 162 Morphology of Grinders' Lung in Schmalkalden. W. Kuhne.  
Arch. Gewerbepathol. Gewerbehyg. 18, 37-52 (1960). German.

In the vicinity of Schmalkalden, on the south of the Thüringer Forest, the manufacture of tools, such as drills, spanners, pliers, etc., is carried on. In addition to large factories there is a multitude of small works where work is done under very unfavorable conditions. Artificial wheels, corundum, emery or carborundum are used. The dust raised in the process consists largely of iron oxide,  $Fe_2O_3$ , with traces of other metals and the main constituent of the stones and the binding material. The data for this report came from the post-mortem examinations of 9 grinders between the ages of 54 and 69 years. In 2 cases death resulted directly from the pulmonary condition. One of these showed simple nodular silicosis, the result of a 5-year spell using natural sandstone. The dust of the stones in use does not produce silicosis. Emphysema was found in all the lungs but in more than half the cases it was of the bullous type. Chronic bronchitis was also found in all cases although it was obscured by terminal infections. Deposits of dust (mostly carbon and iron oxide) were found in the perivascular, peribronchial and pleural lymphatics. In 7 cases changes were found in the blood vessel walls possibly leading to pulmonary hypertension. In general, the pathological findings in these cases, apart from the silicosis case, do not differ, or only in extent, from those observed in other lungs. The position of dust in relation to these changes requires further investigation and comparison with findings in a similar group with no occupational dust exposure.

-- Cond. from Bull. Hyg.

## PHYSICAL ASPECTS OF THE ENVIRONMENT

- 163 Ceruminosis, a Factor in Audiometry. J. Kawchak. J. Occ. Med. 3, 21-24 (Jan. 1961).

Of 31 symptomatic patients, 26 were relieved of symptoms completely immediately after removal of cerumen. The remaining 5 complained of pain, and all had an underlying otitis externa; however, this group also became symptom-free after treatment of the otitis externa. It is interesting that 3 of the 5 complained of pain only after the cerumen had been removed. Of the 46 ears irrigated, 11 and 9 had varying degrees of inflammation of the canal and tympanic membrane, respectively, where the cerumen had been adherent. One ear had inflammation of both canal and tympanic membrane. The canal inflammation was severe enough in 7 to warrant specific treatment. Those with inflammation of the tympanic membrane required no treatment, and none was symptomatic following irrigation. In the majority of patients the Cerumenex (an oleate polypeptide linkage in an aqueous miscible vehicle of propylene glycol) was left in the canal for approximately one hour, and the time required for irrigation was 5 minutes or less for 34 of the 46 ears irrigated. In none of the 36 patients was there evidence of any untoward reaction from the ceruminolytic agent used. Instrumentation was not used in any of the 36 patients. Of the 22 patients who complained of hearing impairment, 18 had definite objective evidence of improvement by audiogram, and the remaining 4 were relieved of symptoms despite little change by audiogram.

- 164 A Criterion for Evaluation of Noise Exposures. A. R. Jones and F. W. Church. Am. Ind. Hyg. Assn. J. 21, 481-485 (Dec. 1960).

A new method of appraising noise exposures has been developed. It is based on the concept of hearing conservation rather than of damage risk. Hearing conservation criteria are used to judge whether or not hearing conservation measures should be taken rather than to predict when hearing loss will occur. The method proposed for evaluating noise data takes into account the more restrictive recommendations made recently for the 4th, 5th and 6th octave bands. Exposure time variations are taken into account by means of a new form that has been devised for plotting octave band measurements. A supplemental graph is presented and can be used for summing up noise exposures at different intensity levels, with the over-all exposure expressed as "Per Cent of Allowable Weekly Noise Dose."

-- Authors' summary

- 165 Evaluation of Exposures to Industrial Noise. S. E. Pihl. Am. Ind. Hyg. Assn. J. 21, 486-490 (Dec. 1960).

There is much more to making a noise survey than reading the dials on a sound level meter. Care must be exercised in gathering and recording the pertinent data relating to the environment, the exposure and the sound levels. In addition, it is essential that the person making the sound level measurements be familiar with the operating characteristics of the equipment, so that warning signs of malfunctioning of the equipment can be recognized. This will help insure reliable measurements in the field, where conditions are frequently far from ideal.

-- Author's conclusions

- 166 Effects of Noise Reduction in a Work Situation. D. E. Broadbent and E. A. J. Little. Occ. Psychology 34, 133-140 (Apr. 1960).

The study here described was carried out among groups of factory workers performing standard tasks in the production of cinefilm in their normal working conditions, except that, for the experiment the effects of reduced noise levels were examined. One room was treated by placing sound-absorbent material on the wall, reducing noise levels from

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about 99 db. to 89 db. Various measures of working efficiency were adopted, e.g., measurement of rate of work during periods of no stoppage (point hour), number of shutdowns of process, number of occasions of broken work, number of calls for maintenance, time occupied for curing maintenance faults, labor turnover, and absence from work. The results showed that for many of these criteria there were significant changes after the noise reduction. However, the improvements were not always confined to workers in the acoustically treated rooms. Point hour, for example, improved in the experimental and in the control group, which might be accounted for by a general improvement in morale and attitude to work. Broken work (if due to the operator) on the other hand, declined significantly more in the treated than in the untreated room. Calls for maintenance and time occupied by stoppages for maintenance did not show any statistically significant change. Neither labor turnover nor absenteeism showed significant difference except that for the latter both groups of experimental workers showed some slight advantage compared with the remainder of the department.

-- Cond. from Bull. Hyg.

### RADIOACTIVITY AND X-RADIATION

- 167 Treatment of Carcinoma of the Bladder. A Symposium. I. Treatment by Interstitial Irradiation using Tantalum-182 Wire. H. J. G. Bloom. Brit. J. Radiol. 33, 471-479 (Aug. 1960).

Procedures and results are described for approximately 250 cases of carcinoma of the bladder treated by interstitial irradiation using tantalum-182 wire.

-- Nuclear Sci. Absts.

- 168 Findings of a Survey of X-Ray Units. Oregon's Radiological Health Program. W. R. Stahl, R. R. Sullivan and D. G. Wagstaff. Public Health Repts. 75, 652-658 (July 1960).

A field survey of x-ray units used by all types of practitioners for diagnostic work was made in Oregon during 1958 and 1959. Results of this survey, along with a summary of the efficacy of steps that can be taken to protect the population from unnecessary exposure, are presented.

-- Nuclear Sci. Absts.

- 169 Radiation Ileitis. R. H. Abrahamson. A.M.A. Arch. Surg. 81, 553 (1960).

With modern radiotherapy, the incidence of damage to the small intestine is becoming more frequent. Whenever a loop of bowel is fixed in this area, it tends to receive more radiation than those loops which are fairly movable. The author describes a case of focal ulceration and cicatrizing ileitis in the terminal bound-down portion of the ileum. The patient had 10 different diagnoses over a 20-year period before operation. Obstruction was relieved after removal of a constricted portion of the ileum. The histologic sections show vessel thrombosis, chronic serositis, and arterial degeneration. Surgical excision is recommended for such patients after adequate investigation.

-- Can. Med. Assn. J. Absts.

- 170 Food Preservation by Ionizing Radiation. H. W. Nelson. Battelle Tech. Rev. 10, 8-15 (Jan. 1961).

Research is necessary in a number of areas before food irradiation can be adjudged: economic in comparison with conventional preservation methods; completely safe with respect to the potential toxicity of the irradiated product; and most important, acceptable to the consuming public in terms of cost, palatability, and general acceptance. The



consumer will be the final judge once such foods have been approved by the Federal Food and Drug Administration. The consumer's acceptance of irradiated foods will be based primarily on quality and cost, assuming that his fears of radiation have been allayed. If improvement in quality is too slight to be an important factor, only the commercial advantages of irradiation will serve to encourage its use. The latter might include: longer marketing periods for fresh or fresh-like products; new markets for such products in remote areas; and less spoilage of products that are irradiated. Commercially, over-all economics will dictate how and if radiation will finally be used. At its present stage of development, irradiation is of only marginal interest to the food industry. Therefore, any major research and development is likely to be under governmental sponsorship. Yet in view of the potentials of the processes that have already been revealed, further research seems desirable.

- 171 Radiochemical Determination of Radium in Urine. H. V. Weiss and Ming G. Lai.  
Anal. Chem. 33, 39-41 (Jan. 1961).

By experimentation with radium-223 a rapid and accurate procedure was developed for the determination of minute quantities of radium in urine. The method depends upon the cocrystallization of radium from urine with potassium rhodizonate and the purification of this extract by ion exchange. Radium is isolated in an essentially residue-free form and its recovery from urine is  $94.9 \pm 3.3\%$ .  
-- Authors' summary

- 172 The Difference in Response of Grafted and Normal Skin to Ionizing Irradiation: Clinical Observations. P. Rubin and J. W. Grise.  
Am. J. Roentgenol. Radium Therapy Nuclear Med. 84, 645-655 (Oct. 1960).

From the clinical observations presented, it can be concluded that differences in the pattern of response and recovery to ionizing irradiation occur in grafted skin sites. It is also apparent that there is a spectrum of response ranging from pronounced radio-sensitivity to relative radio-resistance. The reactivity is proportional to the age of the graft.

-- Nuclear Sci. Absts.

- 173 A Protective Lead Apron for the Cautious Radiologist. E. L. Lame.  
Am. J. Roentgenol. Radium Therapy Nuclear Med. 84, 357-358 (Aug. 1960).

Design features are described of a protective lead apron for the protection of radiologists.

-- Nuclear Sci. Absts.

- 174 Aspects of the Control of Radiation Exposure. D. J. Mathias and J. R. A. Lakey.  
G. E. C. Atomic Energy Rev. 2, 172-176 (1960).

A description is given of how comparatively simple modifications to standard x-ray machines have enabled weld radiography to be carried out on the site safely and conveniently. An indication is given of the types of hazard likely to be encountered during the operation of a nuclear power station. The general principles for dealing with these hazards are discussed.

-- Nuclear Sci. Absts.

- 175 Personnel Decontamination Units at Brookhaven National Laboratory. R. A. Love.  
Intern. Rec. Med. 173, 365-368 (June 1960).

The design of a decontamination suite is described which was incorporated in the medical research center for use in the event of a major radioactive contaminating accident. It is suggested that serious thought be given to the incorporation of such a unit in general hospitals for use in case of possible contamination from industrial accidents or radiological warfare.

-- Nuclear Sci. Absts.

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FROM

SCIENCE FOUNDATION

4400 Fifth Ave., Pittsburgh 13, Pa.

## "G MEN" on Job Hazards

*Industrial hygienists  
take over to cope with  
health problems in our  
advancing technology.*

PEOPLE WHO SAY their jobs make them sick are mostly exaggerating. But a growing number of them are simply stating a fact: Occupational health problems are multiplying as an unfortunate by-product of the nation's advances in technology.

Industrial hygiene has become a major concern of workers, employers and insurers alike as job environments have been invaded by potentially dangerous fumes, dusts, irritants and toxic chemicals. More than 4,000 new compounds are now being discovered and put to use each year in products ranging from loaves of bread to space satellites.

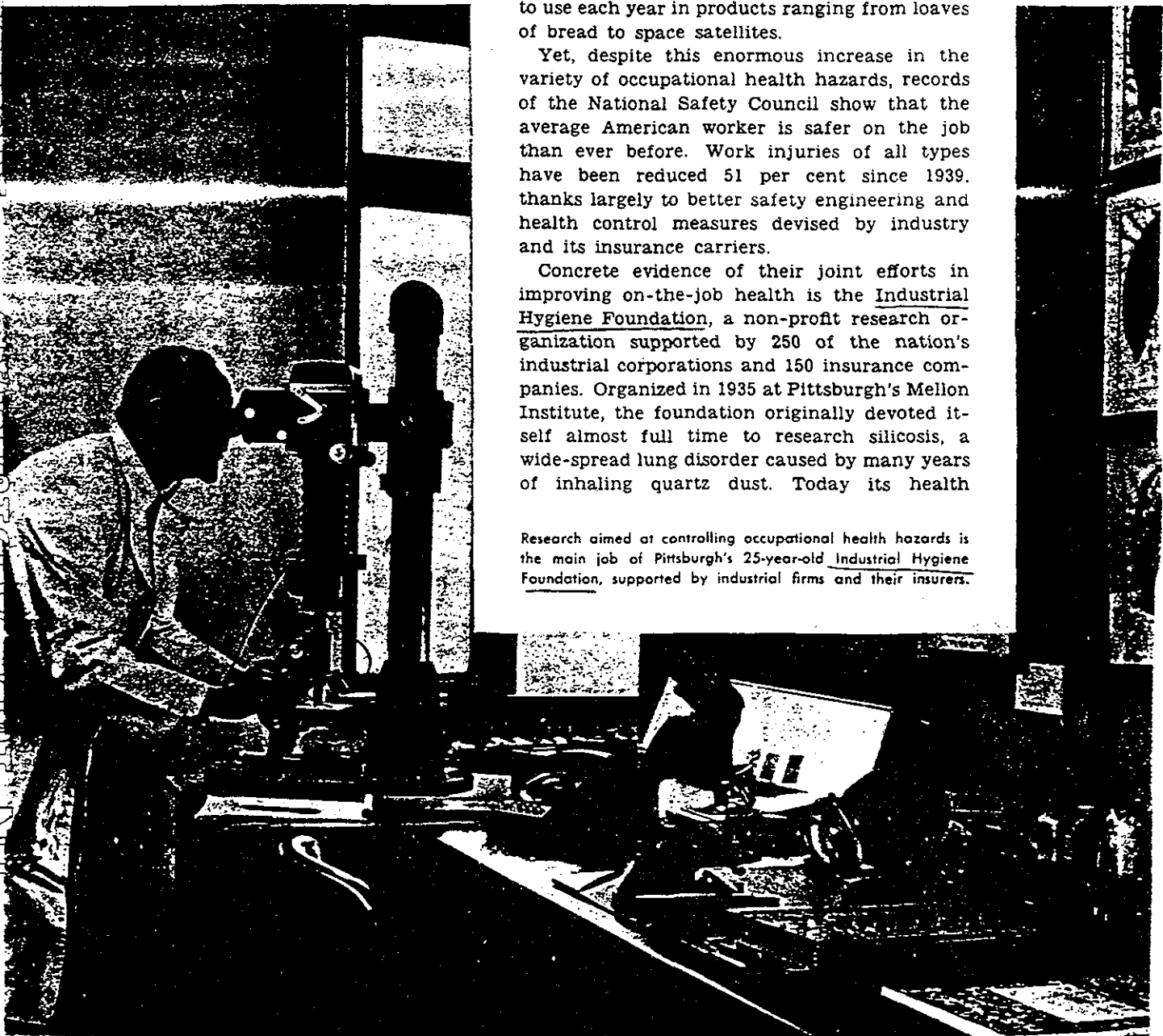
Yet, despite this enormous increase in the variety of occupational health hazards, records of the National Safety Council show that the average American worker is safer on the job than ever before. Work injuries of all types have been reduced 51 per cent since 1939, thanks largely to better safety engineering and health control measures devised by industry and its insurance carriers.

Concrete evidence of their joint efforts in improving on-the-job health is the Industrial Hygiene Foundation, a non-profit research organization supported by 250 of the nation's industrial corporations and 150 insurance companies. Organized in 1935 at Pittsburgh's Mellon Institute, the foundation originally devoted itself almost full time to research silicosis, a wide-spread lung disorder caused by many years of inhaling quartz dust. Today its health

Research aimed at controlling occupational health hazards is the main job of Pittsburgh's 25-year-old Industrial Hygiene Foundation, supported by industrial firms and their insurers.

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TIN REE ABRAMS November 1992



## "G Men" on Job Hazards

sleuthing covers a wide range of products and processes potentially detrimental to the health of exposed workers.

Those versatile new epoxy-resins, for example, are a frequent cause of troublesome skin rashes. Welding fumes and irritating dusts often lead to inflammation of the eyes. Acids eat away tooth enamel, causing decay and ruining the appearance of workers' mouths. Most serious of all are the systemic poisons, ranging from old-fashioned arsenic and mercury to the new boron compounds used in rocket fuels and the manufacture of plastics. Prolonged exposure to some of these highly toxic substances can bring on ailments of the lungs, liver and kidneys and even increase the incidence of cancer.

Industrial companies and insurers may call on the foundation's staff of health experts to provide information on a single product or to evaluate the hazards in an entire plant or industry. Experienced hygienists size up such hazards with an environmental survey, climbing smokestacks and prowling assembly lines to collect samples of fumes, vapors and dusts for study in the foundation's laboratories. There, toxic concentrations can be accurately measured and their effects tested on rabbits, rats and other experimental animals. The foundation's engineering staff has also invented a number of air-pollution instruments to make possible long-range studies of a single plant or an entire city.

One industry-wide project undertaken by the foundation involved a study of heat exposures in the glass industry. Manufacturers wanted to measure the effectiveness of their ventilating

systems and "man-cooling" fans, particularly for production employees working near hot machines. The foundation's experts reported that some workers were still absorbing dangerous amounts of radiant heat, which cannot be reduced effectively by ventilation. They devised aluminum screens to shield the machines and thereby cut workers' exposure by 75 per cent. Other extensive field projects have included a community air-pollution study for the city of New Haven, Connecticut, an evaluation of a large oil company's medical facilities and preventive medicine program, and the development of techniques for tracking stack gases over long distances.

Not all research is conducted in the field, however. Some of the foundation's most useful work consists of toxicological studies on new chemicals and industrial processes. One such study was conducted at the request of fluorescent lamp manufacturers, who ran into trouble with their early models when severe lung diseases resulted from the use of phosphors containing beryllium. New non-toxic phosphors were developed and tested on animals at the foundation's laboratories.

"The first line of defense in the prevention of occupational diseases is the information obtained from toxicological investigation," says Dr. H. H. Schrenk, managing director of the foundation. "Knowledge that a chemical may cause permanent injury to the eyes serves to emphasize the need for rigorous eye protection beginning with the development of the material. Knowledge that a chemical is rapidly absorbed through the intact skin may save a life."

Equally important in controlling health haz-

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← Industrial hygienists take the foundation's mobile laboratory right into a company's plant to collect samples of fumes, vapor, pollutants and toxic substances that might affect the health of exposed workers. Most hygienists have a strong background in engineering as well as chemistry.



ards is the constant vigilance of employers, particularly when introducing new processes. About 1,000 large industrial firms now employ their own hygienists, and many others consult the foundation's staff of experts when designing a new plant or changing an old one. Unfortunately, the nation's three million small and medium-sized businesses—which employ two-thirds of the total labor force—often do neither.

"The majority of small plants simply fail to take toxicity into consideration when they adopt new materials. They just don't recognize that they're dealing with dynamite," says Dr. Henry N. Doyle, assistant chief of the occupational health program of the U. S. Public Health Service.

#### Leadership of Insurance Industry Lauded

Doyle's boss, Dr. Harold Magnuson, told a recent forum sponsored by the National Health Council that small companies should seek out all the help they can get, particularly the safety engineering and industrial hygiene services available free from their insurers.

"The insurance industry has played an important part in providing leadership in health maintenance and preventive medicine in both occupational and non-occupational accidents and illness," Dr. Magnuson noted. "Starting with accident prevention and safety guidance, the insurance carrier is generally well acquainted with the physical environmental factors, work requirements and other occupational conditions. Also, the insurance carriers work closely with the local medical profession in such matters as claims, disability and medical costs."

With an estimated 50 million work days a

year already being lost because of occupational illness, the matter of cost has become a major spur to better health programs in industry. Workmen's compensation awards for silicosis alone amount to more than \$10 million a year. Since management now tends to pay a large share of the tab for hospitalization and medical benefits as well, bad health has become more and more a direct production cost.

Mutual insurance companies strongly advocate pre-employment physicals, periodic medical exams for employees, periodic inspection of the plant for health hazards, and the maintenance of accurate accident and sickness records as the best answer to occupational health problems. Although the small company often feels it cannot afford the expense, surveys by both the U. S. Public Health Service and the National Association of Manufacturers confirm that preventive medicine and industrial hygiene are paying propositions.

The NAM survey, reported by the National Health Council in *The Health of People Who Work*, gives the following results for 1,625 large and small companies that now have such programs: Labor turnover has dropped by an average of 27.3 per cent, absenteeism has declined 29.7 per cent and workmen's compensation premiums have been reduced 28.8 per cent.

As new and potentially hazardous products pour from the laboratories in an ever-quicken- ing stream, both financial and humanitarian considerations demand that workers not be required to risk the most precious product of all—their health. The insurance industry's own resources, and those of affiliated health agencies such as the Industrial Hygiene Foundation, are dedicated to reducing that risk. ©

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← New chemicals and potentially harmful dusts are tested at the foundation's toxicological lab through controlled experiments on guinea pigs, rats, rabbits.

→ Foundation's staff also serves as a nerve center for abstracting research findings on health hazards and preventive measures.



IN THE AIR AMIS - November 1992

Reprinted from *Journal of American Insurance*—Jan 1961  
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- 176 Significance of Radioactivity in Water Supply and Treatment. H. A. Bevis.  
J. Am. Water Works Assn. 52, 841-846 (July 1960).

The increasing number of sources of radioactive contamination of water supplies is discussed along with a general review of the biological effects of alpha particles, beta particles, and gamma rays. The removal of radioactive materials from surface and ground waters was studied. Removals of 46% by coagulation and settling were increased to 70% with the addition of filtration. With lime-soda ash softening, removal efficiencies were increased to 90 to 95%. In mixed beds containing both cation and anion resins, removals in excess of 99.99% were obtained. Special units to decontaminate water supplies were developed. In one unit containing beds of steel wool, clay pellets, activated carbon, and cation-anion-exchange resins in series, removals of 99.99% were obtained.

-- Nuclear Sci. Absts.

- 177 Radiochemical Determination of Plutonium in Urine. H. V. Weiss and W. H. Shipman.  
Anal. Chem. 33, 37-39 (Jan. 1961).

An improved method was developed for the determination of plutonium in urine. Plutonium was cocrystallized with potassium rhodizonate from urine. It was then purified from interfering substances by coprecipitation with lanthanum salts and by ion exchange. Finally, the radioelement was electrodeposited onto a tantalum disk and alpha counted. The average recovery was  $91.3 \pm 5.0\%$  and the analysis time 5 to 6 hours. -- Authors' summary

#### ENVIRONMENTAL MEASUREMENTS

- 178 The Distribution of Dust and Gas by Sutton's Method. R. Trappenberg.  
Intern. J. Air Poll. 2, 27-41 (July 1960).

It is possible to calculate the pollution caused by emission from a chimney by means of Sutton's equations. As the direction of wind is variable and the pollution therefore distributed over an area, the author calculated the mean concentration of gas and deposition of dust over an area of 1000 by 500 meters. The theoretical maximum point is in the center of this rectangle and the longer side is parallel to the wind direction. The results for dust deposition as function of meteorological conditions and height of chimney are given. From the figures and tables given it is possible to estimate the pollution to be expected from an industrial plant with a known emission provided the following factors are known: wind speed and its variation and height, wind direction and its range, frequency, duration, and amount of rainfall. A comparison of the calculated dust deposition with that measured by Diem gave satisfactory agreement. Similar tests of gas and air-borne dust concentration have not as yet been carried out, but there is a need to make such tests in order to confirm the calculated results.

-- APCA Absts.

- 179 The Concentrations of Oxidant (Ozone) and Nitrogen Dioxide in the Air of Cincinnati, Ohio.  
J. Cholak and L. J. Schafer. Am. Ind. Hyg. Assn. J. 21, 452-458 (Dec. 1960).

The reactions between hydrocarbons and nitrogen dioxide producing "photochemical smog" and oxidant have become increasingly clear in the past few years and are generally accepted as accounting for Los Angeles smog. Interest in "photochemical smog" and the need for a variety of reasons, for establishing trends in pollution have resulted in several investigations of the occurrence of oxidant and nitrogen dioxide in the atmosphere of a number of communities. Investigations starting in 1954 in Cincinnati and in several other cities in the eastern section of the country were generally of such brief duration or they were made during such times

of the year that it was not possible to obtain sufficient data to establish reliably the patterns and trends in the concentrations of oxidant and nitrogen dioxide in the air of these cities. For this reason a program for monitoring the air continuously for a variety of pollutants was carried out in Cincinnati over a period extending from January 1, 1957 to December 31, 1959. The purpose of this paper is to describe the observations concerning the concentrations of oxidant, nitrogen dioxide, and nitric oxide. The subject is discussed under the following headings: sampling sites, procedures, results and discussion. Data are presented in the form of graphs and tables.

- 180 Benzo (a)Pyrene Content of the Air of American Communities. E. Sawicki, et al.  
Am. Ind. Hyg. Assn. J. 21, 443-451 (Dec. 1960).

Examination of the benzpyrene content in the air of 131 urban and non-urban areas in various parts of the country has disclosed that benzpyrene is universally present. Samples from sites in urban areas yielded higher concentrations of benzpyrene in the air and in air-borne particulates than those from non-urban areas. The concentration of benzpyrene at these sites was found to vary from 0.01 to 61 micrograms per 1000 cu.m. of air. A 12-month study of the atmospheric benzpyrene concentration in 9 large, widely separated American cities has shown that, for the majority, the concentration of benzpyrene in air-borne particulates and in the air is at the highest level during the winter months and at the lowest level during the summer months. A map of the different concentrations of benzpyrene found in the air shows a geographic variation which needs a more thorough study. The lower concentration of benzpyrene in the particulates and in the air of California communities may be attributed to less winter heating, use of liquid and gaseous fuels, and in addition may be due to the action of California sunshine and oxidizing atmosphere. If annual inhalation of benzpyrene may be considered a measure of lung cancer exposure, this exposure is about 100 times greater for an urban resident than a non-urban one, and the exposure is greater for a non-smoker in many large American cities than for a pack-a-day smoker in a non-urban American community. In many American cities the exposure to benzpyrene of the urban dweller who smokes a pack a day is double that of the non-smoking urban resident.

-- Cond. from authors' summary

- 181 Monitoring Sulfur Dioxide with Lead Peroxide Cylinders. F. W. Thomas and C. M. Davidson.  
J. Air Pollution Control Assn. 11, 24-27 (Jan. 1961).

The field experience in the use of lead peroxide cylinders for evaluating sulfur dioxide reactivity in the vicinity of large coal-burning steam plants has been described. The cylinders are considered to provide a useful and economical means of estimating integrated sulfur dioxide exposure. In an area of moderate or average concentration, a high degree of correlation was noted between sulfur dioxide exposure and lead peroxide sulfation. No deterioration in the rate of reactivity of lead peroxide with sulfur dioxide was noted in periods as long as 4 months. This technique might be even more useful in certain urban and industrial areas or in remote areas where power operated instruments cannot be used. Data from lead peroxide cylinders are useful in providing an estimate of corrosion potential as well as a measure of air pollution control. The higher average sulfur dioxide concentrations in urban or industrial areas should enhance effectiveness and largely eliminate analytical problems associated with low sulfation rates. Increased sensitivity may now be obtained by advanced analytical techniques, one being the colorimetric procedure described by S. Kanno (Intern. J. Air Pollution 1, No. 3, Jan. 1959).

-- Authors' summary

- 182 A Field Method for the Determination of Sulfur Dioxide in Air. G. C. Hands and A. F. F. Bartlett. Analyst 85, 147-148 (Feb. 1960).

Strips of filter paper are impregnated with an ammoniacal solution of zinc nitroprusside, dried at a temperature not exceeding 40°C and stored in the dark. The paper is moistened with water by means of an insufflator and fixed in a holder. A 360 ml. sample of air is drawn through the paper at a rate not more than 6 ml./sec., and the brick-red stain

produced if sulfur dioxide is present is compared with a standard stain chart or with a disk of standard tints in order to determine the concentration of the gas. A series of 5 colors, representing 1 to 20 ppm of sulfur dioxide in a 360 ml. sample, was found to be adequate.

-- APCA Absts.

- 183 A Spectrophotometric Method for the Determination of Mercaptans in Air. H. Moore, H. L. Helwig and R. J. Graul. Am. Ind. Hyg. Assn. J. 21, 466-470 (Dec. 1960).

The method described is quick and accurate and determinations may be made using apparatus common in air pollution and industrial hygiene work. The method determines total mercaptans and does not differentiate between individual mercaptans although it is most sensitive to the low molecular weight alkanethiols. Hydrogen sulfide, sulfur dioxide, and nitrogen dioxide do not interfere at the concentrations usually encountered in air pollution and industrial hygiene studies.

-- Authors' conclusions

### PREVENTIVE ENGINEERING

- 184 Recommendations on Heights for New Industrial Chimneys. G. Nonhebel. Smokeless Air, No. 114, 280-299 (Summer 1960).

Engineers responsible for the design of new factories are frequently faced with the difficulty in deciding the height of chimneys to disperse adequately the discharged gases and residual dust. Under the Clean Air Act, local authorities must approve the height of new chimneys. The major consideration is the effect of the discharge at ground level. Formulae have been used for some years for calculating the gas concentration and rate of dust fall under normal weather conditions. From a review of available information, recommendations are now made that the height of a new chimney serving a large plant should be such that the calculated 3-minute maximum concentration of sulfur dioxide at ground level should not exceed 40 parts per hundred million in areas of heavy industry or high housing density and 50 pphm in other areas. Similarly, the calculated maximum rate of deposit of grit and dust from a new chimney should not exceed 1000 g./100 sq. m. per month with a wind direction constant within an octant. The formulae proposed are not applicable to emissions from relatively low chimneys serving small plants; consequently, recommendations based on experience are made for a sliding scale of heights from 60 to 120 ft. for boiler plants of aggregate capacity 5000 to 33,000 lb./hr. Worked examples show that rate of dust deposit rather than ground-level concentration of sulfur dioxide is usually the factor which should control the height of boiler plant chimneys. Prevention of emission of particles or aggregates larger than 76 microns is most important. Additional factors meriting consideration are: (1) rate of ground coverage by a film of deposited dust (less than 0.04% per day suggested); (2) distance from the chimney at which dusty plumes become substantially invisible; (3) chimney heights suggested.

-- Public Health Eng. Absts.

- 185 Correlation of Dust Scrubber Efficiency. K. T. Semrau. J. Air Pollution Control Assn. 10, 200-207 (June 1960).

Data correlated in this and an earlier paper are summarized in a table and figure. In all cases it is found that the number of transfer units may be represented by a simple exponential function of the contacting power. Correlation of the literature data generally confirms the findings of the earlier studies, on the relationship of efficiency and contacting power. Efficiency is found to have little relation to scrubber design and geometry, but to be dependent on the properties of the aerosol and on the contacting power. There are few data to show the effect of scrubber size, but a number of the studies cited report that there are essentially no



scale effects. The data specifically support the earlier observation that contacting power derived from hydraulic spray nozzles is equivalent to that derived from gas pressure drop. There are no data available to test the hypothesis that contacting power from pneumatic spray nozzles is also equivalent. The available information is insufficient to demonstrate unequivocally that contacting power supplied mechanically is equivalent to that derived from gas pressure drop or hydraulic spray nozzles. However, it does strongly indicate that such may be the case.

-- Cond. from author's summary

- 186 Studies in High-Temperature Gas Cleaning. The Reduction of Fumes from Open-Hearth Furnaces. W. Strauss and M. W. Thring. J. Iron Steel Inst., 196, 62-65 (Sept. 1960).

Various methods for dealing with the orange or brown fume produced by oxygen lancing have been investigated. Electrostatic precipitators, bag filters, and multicyclones followed by venturi scrubbers have proved successful in individual cases. Economic considerations which govern the choice of a suitable method for each case are the quantities of dirty gas to be handled, the degree of cleaning required, the rate of gas production, an adequate water supply, and the space available for the erection of a gas cleaning plant. Experiments in filtering waste gases from open-hearth furnaces at temperatures of 375°C, using a coarse granular filter medium, colder than the gases to give thermal precipitation, gave efficiencies better than 90% under many operating conditions and pressure drops varying between 2 and 4 in. water gauge, for a 9-in. thick bed. Beds of 1, 3, and 10 1/2 in. were also investigated under a wide range of operating conditions. Ceramic filters and crushed refractory beds were also tested.

-- APCA Absts

- 187 Air Pollution from Alfalfa Dehydrating Mills. Anon. U. S. Public Health Service, Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio, Tech. Report A60-4, 25 pp. (1960).

This report discusses the quantity and size distribution of dust discharged to the atmosphere from alfalfa dehydrating mills, as determined by a study of a group of representative plants in Kansas and Ohio. It also discusses dust collection practices at typical plants and the relationship between these collection practices and the protein and carotene (pro-vitamin A) content of the meal produced. The appendix gives detailed layout and description of plants and particulate sampling points.

-- Public Health Eng. Absts.

#### COMMUNITY AIR HYGIENE

- 188 Air Pollution Review 1958 - 1959. W. L. Faith. Ind. Eng. Chem. 52, 967-971 (Nov. 1960).

This review includes articles in which a specific application to air pollution is made. Literature dealing with concentration and determination of specific pollutants has increased; greater emphasis has been given to automobile exhausts, with the State of California adopting standards for emissions of carbon monoxide and hydrocarbons; presence of radioactive materials in the atmosphere and in industrial wastes is covered. Training courses and manuals for pollution control and abatement personnel are discussed. An extensive bibliography is appended.

-- APCA Absts.

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- 189 Survey of Air Pollution Research in Europe. A. C. Stern.  
Am. Ind. Hyg. Assn. J. 21, 459-465 (Dec. 1960).

The air of European metropolises tends to be more visibly polluted than that of comparable American cities, a difference most likely attributable to the widespread availability of natural gas in America. This has pointed the need for both air pollution research and control in each of the European nations. The total air pollution research effort of Europe is comparable in size and scope to that in America. In America, the results of work in all states and provinces are rapidly disseminated at frequent national conferences and seminars, whereas in Europe interchange of information is impeded by language and political barriers that tend to dilute the large total effort by requiring each nation to duplicate much of the same work.

-- Author's conclusions

- 190 Application of Gas Chromatographic Methods for Air Pollution Studies. L. S. Ettre.  
J. Air Pollution Control Assn. 11, 34-43 (Jan. 1961).

The modifications on conventional gas chromatography apparatus are described which allows the use of gas chromatography in air pollution studies. The newest developments of supersensitive chromatography are described with special respect to their importance in trace analysis. The construction, and operation of a new instrument based on the flame ionization principles is detailed.

-- Author's summary

- 191 A Method for Analyzing the Trend in Visibility. G. C. Holzworth and J. A. Maga.  
J. Air Pollution Control Assn. 10, 430-435, 449 (Dec. 1960).

A method of analysis has been introduced for the treatment of visibility trends. This method is based on the assumption that with a trend of deteriorating visibility, the resultant changes (with time) in the per cent frequencies of visibilities in given ranges shift downward to each next longer range of visibility. Data for Bakersfield and Sacramento indicate a trend of deteriorating visibility. At both airport sites poor visibilities are shown to be more frequent with air flow from nearby urban complexes than from rural areas. This relationship, together with a rapidly expanding population, is further evidence for a trend of declining visibility throughout the Central Valley. In addition to pollution from population centers there are other sources whose effects on visibility are more difficult to analyze: for instance, open burning practices, particularly with respect to agricultural waste elimination, range land clearance, and uncontrolled fires. A relationship between wind speed and visibility indicates that with intermediate speeds there is a smaller per cent frequency of poor visibilities than with both higher and lower wind speeds. This is interpreted as due to dusts becoming air-borne at higher wind speeds, and atmospheric dispersion of pollutants being reduced at lower wind speeds. Application of the method of trend analysis to Los Angeles visibility summaries indicates a declining visibility trend prior to controls on certain emissions. After such controls the trend is negligible. The significance of the latter trend is that it occurred while the population was growing rapidly.

-- Authors' conclusions

- 192 The Biological Scientist in an Air Pollution Control Program. H. A. James.  
J. Air Pollution Control Assn. 10, 450-452, 467 (Dec. 1960).

The biological scientist in an air pollution control agency is becoming of greater service as the larger districts are being formed which embrace agricultural areas. While it is not an altogether new role in history, it has often been neglected. His presence on the staff provides the air pollution control agency staff with a liaison to agriculture and public health, as well as an information source immediately at hand. His training in the life science fields not only allows him to help understand the biological problems, but also allows him to communicate these to the engineer. In the Bay Area Air Pollution Control District, this position is filled by a biostatistician. Here the statistical duties are often not too sharply differentiated from the biological ones. However, these range from attempting to diagnose air pollution damage on orchids to the development of a mechanized punch card information retrieval system.

-- Author's conclusions

- 193 Bamboo for Gas Cleaning. Anon. New Scientist (London) 7, 1539 (June 16, 1960).

Gases from blast furnaces, which are laden with fumes, may be cleaned by passing them upward through a tower which has been packed with layers of wet bamboo. This method, which was developed by scientists at the North Eastern Polytechnical Institute, was found to be very efficient for dealing with gases from small blast furnaces. It was felt that there should be no reason why it should not prove just as effective with larger volumes. After such gases have been cleaned, their high content of heat makes them of economic value elsewhere in the steel plant. The use of bamboo in such a manner may be unconventional but it offers to the Chinese metallurgists equipment which is simple to construct, operate, and maintain. Also, its efficiency is very high and the costs of installation are low. -- APCA Absts.

- 194 Gas Chromatographic Analysis of Incinerator Effluents. W. N. Tuttle and M. Feldstein. J. Air Pollution Control Assn. 10, 427-429, 467 (Dec. 1960).

A procedure for the gas chromatographic analysis of incinerator effluents has been described and has been used to analyze the effluents from a series of incinerators. Results indicate that, when the concentration of  $C_2$  hydrocarbons is below 10 ppm, the  $C_3$  to  $C_6$  hydrocarbons are generally present in less than 1 to 2 ppm. When the  $C_2$  hydrocarbons are present in high concentrations, the  $C_4$  to  $C_6$  compounds are generally present in significant concentrations. Some specific  $C_4$  to  $C_6$  compounds found in the effluents from incinerators have been identified. The standard of 50 ppm  $C_2$  to  $C_6$  hydrocarbons in incinerator effluents appears to be a satisfactory emission standard since it adequately differentiates between incinerators which are well designed and operated and those which are not. -- Authors' conclusions

- 195 Automobile Exhaust Particulates—Source and Variation. H. C. McKee and W. A. McMahon, Jr. J. Air Pollution Control Assn. 10, 456-462 (Dec. 1960).

Automobile exhaust particulates amount to approximately 5% by weight of the amount of gaseous hydrocarbon emission, and consist of lead compounds, carbon particles, motor oil, and non-volatile reaction products formed in the combustion zone from motor oil. These reactions involve the formation of free acidity, high molecular weight olefins, and carbonyl compounds. Quantitative estimates of the effects of engine design variables and changes in operating condition on these chemical reactions cannot be made because of the very complex relationships involved. Particulates in the blowby are composed almost entirely of unchanged lubricating oil. As a very rough approximation only, the amount of material emitted in the blowby is perhaps one-third to one-half the amount emitted in the exhaust; the same approximate ratio applies to either particulate emission or gaseous hydrocarbon emission. Blowby emissions are influenced by mechanical condition of the engine, probably to a greater extent than exhaust emissions. The total amount of exhaust particulate emitted from automobiles is much less than the amount of hydrocarbon vapor emitted, and therefore from an over-all pollution standpoint is less important as a primary pollutant. The extent to which the particulates may influence atmospheric reactions is not known, but the physical and chemical nature of the particulates would indicate that important effects might occur. The catalytic effects of finely-divided carbon are well known, and the non-volatile olefinic, acidic, and carbonyl compounds associated with the carbon might be expected to be quite reactive. This suggests the possibility that the particulates might influence the course of gas-phase atmospheric reactions through catalytic or other effects. -- Cond. from authors' summary

- 196 Standards for Air Quality in California. J. A. Maga and J. R. Goldsmith. J. Air Pollution Control Assn. 10, 453-455, 467 (Dec. 1960).

It is hoped that air quality standards adopted by the California State Department of Public Health will be of value in the State's attack on air pollution and that they will promote studies and research needed to refine and extend the standards. Standards must not be a substitute for knowledge and good judgment. They can only act as guides. As in the case for other

standards, those for air quality are not precise figures below which there is complete safety and above which there is certain illness or death. Obviously, they can sometimes be exceeded without injury to an individual. The air standards that have been adopted will have to be used intelligently with the appreciation of their limitations as well as their application.

-- Authors' conclusions

- 197 An Inspection Method for Automobile Hydrocarbon Emission. R. L. Chapman.  
J. Air Pollution Control Assn. 10, 463-464 (Dec. 1960).

In June of 1959, the Governor of California took the first step toward the formulation of unprecedented legislation to control the emission of specific air contaminants from motor vehicle exhaust. Years of endeavor by scientists and public officials preceded this act, but in order to implement it, much more work lay ahead. Not the least of this involved the development of practical, simple methods for the analysis of auto exhaust, they may be used by the law enforcing agencies. This inspection method together with its possibilities and limitations is briefly described. The author concludes that at the present time California is very close to being able to draft logical, effective legislation to control automobile generated smog. There are physical means of controlling the emission of the smog producing components, and now there are methods of inspecting these control devices.

- 198 Control of Odors from a Continuous Soap Making Process. J. E. Molos.  
J. Air Pollution Control Assn. 11, 9-13, 44 (Jan. 1961).

Control of odors has always been one of the most difficult problems which confront air pollution engineers. In most cases, and this one was no exception, the concentration of the gas or vapor responsible for the odor is quite low. Even so, the odor impact may be considerable, and the cost of removing a few parts per billion can be formidable. Quite fundamental to the solution of any such problem is identification of the odorant. In this case amines were indicated both by odor identification and by chemical examination of air samples. Odor identification assisted greatly in selection of suitable sampling equipment and sampling media. Selection of proper control equipment follows identification of the odorant. Usually a number of control methods are suitable. In this instance, the types of control considered were adsorption on activated charcoal, oxidation by chlorine or ozone, combustion and catalytic combustion, odor counteracting, and scrubbing with a strong inorganic acid. Combustion and scrubbing were selected largely because of availability and economic considerations. Pressures of neighborhood residents were an ever-present consideration in the present situation. It could not justifiably be argued that these complaints were not valid, and there was certainly an air pollution ordinance in effect. Nevertheless, to simply have submitted to these pressures and invoked the ordinance seemed unfair in view of the earnest, though unsuccessful (at the time) efforts of the company to control their problem. Since no one could tell the company exactly how to solve the problem, trial and much error were inevitable. -- Author's conclusions

#### MANAGEMENT ASPECTS

- 199 Alcoholism, A Genus and Some of Its Aspects. E. M. Jellinek.  
Can. Med. Assn. J. 83, 1341-1345 (Dec. 24, 1960).

A survey of what is regarded as alcoholism in various cultures, and even within the subcultures of a given country, shows that alcoholism is a genus with many species. Only 2 factors are common to this genus, namely drinking and damage resulting from it. Thus the definition of the genus cannot but be a vague one. On the other hand, various species of the genus can be delineated in stringent terms. Five of the most common species of alcoholism

are presented in a schematic form which takes into account the degree of physiological and psychological vulnerability, as well as sociocultural and economic factors in the etiology of the species in question and various elements of the "alcoholic process". It is suggested that only 2 species of alcoholism, which represent addiction in the strict pharmacological sense, may be seen as diseases. Two other species may be symptoms of an underlying disorder, and one species, although it produces bodily and mental complications, is neither a disease nor a symptom of a disease but is the result of cultural drinking patterns in certain ethnic groups.

-- Author's summary

- 200 A Method of Clinical Orientation to Alcohol Addiction. R. G. Bell.  
Can. Med. Assn. J. 83, 1346-1352 (Dec. 24, 1960).

Proper attention to the chemical factors in addiction introduces the problems of addiction to all medical undergraduates early in their training. Even before graduation they could be conditioned to expect as unhealthy a condition from the effect of chemicals as from living micro-organisms. Medical graduates today have sufficient training in psychiatry to cope successfully with the psychological factors in the majority of alcohol addicts. Most alcohol addicts can be effectively treated if the physician takes the trouble to feel secure with his knowledge of the condition and thereby conveys his confidence to the patient who seeks help. The first interview of an alcohol addict with a physician is all-important. It should serve to disprove the warn-out concept that "only an alcoholic can understand an alcoholic". If the physician appreciates that initial resistance to treatment is an integral part of this self-perpetuating disability, he can be mentally prepared to cope with resistance and not become exasperated or discouraged by relapses in the early stages of rehabilitation. From the first interview the physician should think in terms of periodic contact with his patient for at least 2 years regardless of whether he is participating in an Alcoholics Anonymous program or not, and should retain his role of supervising physician and counselor. If all physicians were adequately oriented to the clinical problems of addiction, there would be fewer mistakes in administering drugs to patients who cannot tolerate them normally or who could be started on addiction in another form. The problems of addiction are too great to be dealt with effectively by any one specialty. Until physicians as a whole are willing to participate in treating and counseling the addict, little improvement in the clinical management of addiction can be expected.

-- Author's conclusions

- 201 Management of Acute Alcoholic Intoxication. M. P. Hoover.  
Can. Med. Assn. J. 83, 1352-1355 (Dec. 24, 1960).

An attempt has been made to present a practical approach, from the standpoint of the average practitioner, to the over-all management, whether at the home, the office, or in the hospital, of the acutely alcoholic intoxicated patient. It has been suggested that certain limits should be set, especially for the chronic repeater, primarily with the view that he may be motivated in the direction of accepting some responsibility and treatment of his problem. The necessity for using any technique or agency available has been stressed. If a special clinic exists in an area, this service should be used when necessary. Specific medications employed in the management of the acute withdrawal phase are mentioned, and the fact that paraldehyde and barbiturates are not used is commented upon. The emergency aspect of delirium tremens is emphasized and measures for investigation and management are outlined.

-- Author's summary

- 202 Death by Liver Cirrhosis and the Price of Beverage Alcohol. J. R. Seeley.  
Can. Med. Assn. J. 83, 1361-1366 (Dec. 24, 1960).

It appears that deaths from liver cirrhosis, though small in number, are increasing rapidly, and rise and fall with average alcohol consumption. It also appears that alcohol consumption rises and falls inversely with alcohol price. It is sufficiently credible to justify a social experiment to determine whether an alcohol price increase would reduce liver cirrhosis mortality, while simultaneously furnishing a sizeable increase in government revenue, and hence occasion an increase in government services or a reduction in other forms of taxation.

## ACCIDENTS AND PREVENTION

- 203 Cause and Prevention of Accidents. C. L. Wilbar, Jr.  
Reprint from Public Health Reports 75, 3 pp (July 1960).

In Pennsylvania, accidents have been the fourth leading cause of death since 1900 and remain firmly established in this position. In the early part of the century, they were preceded by infectious diseases. Now they are preceded by heart disease, cancer, and vascular lesions of the central nervous system. In 1958, 5,056 Pennsylvanians were accidentally killed. The death rate from accidents per 100,000 population in that year was 16.2 for motor vehicle accidents and 29.3 for non-traffic accidents. Accidents are prevented by first locating the causes. After having ascertained the causes, steps are then taken to either correct or modify the environmental hazard or to change the attitudes and habits of the people involved, or both. The Pennsylvania Department of Health through its section of environmental safety is engaged in a survey of the types of accidents that bring people to hospitals. Information on non-fatal injuries is gathered from 100 hospitals reporting accidental injuries treated to the health department. They show a difference compared to data on types of fatal accidents experienced. There is a higher rate of injuries from non-fatal falls in the middle years of life, but a higher rate of fatal falls in the early and late years. Cuts and piercing injuries seldom prove fatal, yet there are indications that these may be the major forms of non-fatal accidental injuries. Most non-traffic accidents occur in the home, where the population spends more time than elsewhere. Most fatal injuries occur to persons in the very young or very old age groups, whereas most non-fatal accidents occur in the age group 15 through 24 years. Males have a much higher accident rate than females. Non-whites have a much higher rate than whites. Physical shortcomings which interfere with coordination, balance, and locomotion obviously predispose individuals having these shortcomings to accidents. So do certain visual and auditory abnormalities and conditions, which prevent the individual from having mental control of his activities such as fainting, convulsions, heart attacks, cerebral hemorrhage, and such.

- 204 Too Hazardous for Minors Under 18. Hazardous-Occupations Orders Issued for Power Saws, Guillotines, Demolition and Shipbreaking. Anon. Safety Standards 10, 24-25 (Jan.-Feb. 1961).

The Secretary of Labor issued recently 2 new hazardous-occupations orders setting an 18-year age minimum for employment in certain occupations. Hazardous-Occupations Order No. 14 applies to the operation and maintenance of power-driven circular saws, band-saws, and guillotine shears; H. O. Order No. 15 covers all occupations at the site of wrecking, demolition, and shipbreaking operations. Both Orders became effective November 15, 1960. The Orders were based upon reports of extensive investigations made by the Department of Labor's Bureau of Labor Standards and reviewed by an outside committee of technical experts. At public hearings held September 14, no opposition was expressed. The Bureau's investigators found that power saws and shears are too hazardous for young workers regardless of the material being processed, a thought unanimously concurred in by various safety experts interviewed. Their findings cite numerous injuries to 16- and 17-year old operators of such machines, including multiple amputations of fingers, fractures, and severe lacerations of fingers and hands, showing that safe operation of this equipment requires "caution, good judgment and skill", characteristics that 16- and 17-year-olds often lack. Wrecking and demolition hazards, according to Bureau investigators, include those of operating a wide variety of power equipment, falls from different levels, being struck by falling objects and by swinging loads, collapse of floors and walls, high voltage dangers, fire, explosions, handling heavy materials, and infection from puncture wounds. Hazards in shipbreaking are much the same, with added serious danger from toxic fumes while cutting metals in confined spaces, and from the use of power shearing machines.

- 205 Gas Masks for Industrial Safety. S. J. Pearce.  
Modern Sanit. Bldg. Maintenance 12, 11, 39 (Dec. 1960).

Gas masks are not designed to be used, nor can they be used safely, under all conditions. Limitations are not unique with gas masks; every respiratory protective device has some limitations. Those for gas masks are: since a gas mask adds no oxygen to the air being breathed, it cannot be used in atmospheres containing less than 16% oxygen. It is also limited to atmospheres that contain no more than 2%, by volume, of a single harmful gas or a combination of gases (3% of ammonia). Not all canisters will protect against all gases. On the other hand, the gas mask has certain favorable features. The wearer is not hampered by trailing air lines; hence he can enter and leave a contaminated area through different openings. The gas mask is relatively light; its total weight, as worn, ranges from 3 1/2 to 7 pounds. Many types of gas masks are available: some have canisters designed to protect against a single gas, such as ammonia; others protect against 2 classes of gases, such as acid gases and organic vapors; and the universal gas masks give protection against all industrial gases, vapors, and smokes. Gas masks are widely used by men in fumigating buildings and grain bins, in operating and maintaining chemical plants, in tank-gauging operations of the petroleum industry, in fire-fighting, and in missile-fueling activities. Gas masks should not be used as a substitute for good engineering practices, such as controlling toxic gases and vapors at the source or removing or diluting of them through proper ventilation. It is advisable to store gas masks intended primarily for emergency use just outside the area where a gas emergency might occur.

- 206 You, Too, Can Stop Hand Burns. Anon. Occ. Hazards 23, 30 (Jan. 1961).

This article relates to heat-resistant mitts worn by gaugers making strip steel. The gaugers stand beside the conveyor that moves strips from the mill. These strips are so hot the gaugers must wear complete face, arm, and hand protection against radiant heat. Occasionally the gaugers stop the conveyor to see if the steel strip is uniform. A strip may be 100 to 1,000 feet long, 0.008 to 1.5 inch thick. A gauger picks up part of the strip with tongs held in one hand, measures the thickness of the steel with a micrometer held in the other. For a long time, gaugers used heat-resistant gloves that lasted no more than one shift. Heat, pressure, and abrasion combined to make the gloves break down, even split wide open exposing the gaugers' hands to bad burns. To remedy the situation the company developed a one-finger mitt made of aluminized asbestos and chrome leather. Thumb and palm are leather. The aluminized fabric, backed with a wool lining, covers the back of the hand. Hand burns stopped when the new mitt was introduced. The mitts last 6 weeks. Every gauger has his own pair and takes care of them accordingly.

MISCELLANEOUS

- 207 Measurement of Organic Contaminants in the Nation's Rivers. F. M. Middleton and J. J. Lichtenberg. Ind. Eng. Chem. 52, 99A-102A (June 1960).

A beginning survey, using the carbon filter technique, shows variability of contaminant concentrations and reveals important specific contaminants in 5 major rivers. This survey is a part of the National Water Quality Network of the U. S. Public Health Service. Concentrations of chloroform and alcohol extractable materials for the period September 1957 to April 1958 are shown for the Colorado, Columbia, Mississippi, Ohio and Missouri Rivers and for Lake Superior. Clean waters usually contain less than 100 parts per billion (ppb) of chloroform extractables. In the 5 rivers examined 100 ppb or less occurred as follows: Ohio—50%; Mississippi—72%; Missouri—90%; Colorado—92%; Columbia—96%. When computed on a tons per 24 hour basis, the organic load was found to increase with the flow.

The chemical separation of the chloroform extracts of the carbon filter followed by various identification procedures revealed the presence of specific contaminants as follows: DDT was found in the Missouri, Mississippi, Columbia and in an earlier survey in the Detroit River. Aldrin was found in the Snake River. Concentrations of these insecticides ranged from 1 to 20 ppb. Orthonitrochlorobenzene was found in the Mississippi River from below St. Louis to New Orleans in concentrations of 1 to 37 ppb. Phenyl ether has been found in several waters. General types of chemicals found include nitriles, various substituted benzenes, phenols, synthetic detergents, acids, ketones, aldehydes, alcohols and amines.

-- Public Health Eng. Absts.

- 208 Profitable Pickle Liquor Regeneration. A. E. Dembitz.  
Ind. Wastes 5, 50-52 (June 1960).

A process is described for profitable pickle liquor reclamation. Spent pickle acid is concentrated, ferrous sulfate monohydrate is crystallized out in a multiple effect evaporator. The ferrous sulfate is roasted in a multiple hearth furnace to produce iron oxide. The sulfur dioxide gases from roasting are then converted into 98% sulfuric acid in a contact acid plant.

-- Public Health Eng. Absts.

- 209 Treatment of Wastes from Coffee Processing in Costa Rica. H. R. Pahren and R. F. Saenz.  
U. S. Public Health Service, Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio, Tech. Report W60-2, 17 pp. (1960).

Although little is known in the United States about the industrial wastes resulting from the processing of coffee cherries, it is an important problem in the coffee producing countries of Central and South America. Water is a scarce commodity in many of these areas and streams are being subjected to a damage from which they cannot recover. Wastes are sometimes discharged into dry channels where decomposition occurs, and an odor nuisance develops, affecting those living in the vicinity. Since there was a desire to determine the feasibility of the treatment of these wastes in stabilization ponds in the country of Costa Rica, a preliminary study was made to learn more about the characteristics of the coffee wastes. Tentative calculations were then made concerning the size of stabilization ponds necessary for these wastes. A brief outline of the information collected is summarized.

-- Public Health Eng. Absts.

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## INDEX

|                                              |     |                                              |     |
|----------------------------------------------|-----|----------------------------------------------|-----|
| <u>Abrasive wheels, grinders' lung</u>       | 162 | <u>Books (continued)</u>                     |     |
| <u>Accident(s)</u>                           |     | survey, U. S. Natl.                          |     |
| cause and prevention                         | 203 | acute conditions, seasonal variations        | 119 |
| power saws, guillotine shears                | 204 | interim report on health insurance           | 120 |
| <u>Aerosol(s)</u>                            |     | <u>Boxing gloves for "neurodermatoses"</u>   | 135 |
| mathematical evaluation                      | 152 | <u>California, standards for air quality</u> | 196 |
| photometer, evaluation                       | 155 | <u>Cancer</u>                                |     |
| <u>Air pollutants</u>                        |     | bladder, irradiation therapy                 | 167 |
| from exhaust gases                           | 195 | skin                                         |     |
| <u>Air pollution</u>                         |     | radiation necrosis                           | 137 |
| control                                      |     | treatment                                    | 138 |
| bamboo for gas cleaning                      | 193 | in tobacco chewers                           | 130 |
| and biological scientist                     | 192 | <u>Cardiac(s) in industry</u>                | 128 |
| California                                   | 196 | <u>Cataract(s) formation of occupational</u> | 126 |
| distribution from chimneys                   | 178 | <u>Ceruminosis and audiometry</u>            | 163 |
| gas chromatography studies                   | 190 | <u>Chromium, determination in air</u>        | 143 |
| literature review 1958 - 1959                | 188 | <u>Dermatitis, dermatosis(es)</u>            |     |
| research in Europe                           | 189 | boxing gloves as therapeutic measure         | 135 |
| trend in visibility                          | 191 | dermabrasion in nevi therapy                 | 136 |
| <u>Alcoholism</u>                            |     | dihydroxyacetone                             | 134 |
| clinical orientation                         | 200 | from gold                                    | 133 |
| death by liver cirrhosis                     | 202 | <u>Dihydroxyacetone, as a skin "tan"</u>     | 134 |
| a genus                                      | 199 | <u>Dust collector(s), collection</u>         |     |
| management of acute                          | 201 | in alfalfa mills                             | 187 |
| <u>Alfalfa mills and air pollution</u>       | 187 | scrubber efficiency                          | 185 |
| <u>Aluminum alkyl compounds</u>              |     | <u>Dust counting, determination</u>          |     |
| safeguards for work with                     | 142 | aerosol photometer                           | 155 |
| <u>Aluminum tri-ethyl</u>                    |     | with phase microscopy                        | 156 |
| safeguards for work with                     | 142 | with slit ultramicroscope                    | 154 |
| <u>Asbestos varieties, pathogenic action</u> | 159 | <u>Dust sampling, samplers</u>               |     |
| <u>Asthmatic bronchitis</u>                  |     | electrostatic precipitator                   | 153 |
| in iron ore miners                           | 161 | <u>Ear, ceruminosis and audiometry</u>       | 163 |
| <u>Asthmatic factors in miners</u>           | 127 | <u>Ethylene oxide sterilizer, efficiency</u> | 132 |
| <u>Atherosclerosis</u>                       |     | <u>Exhaust gases, automotive engines</u>     |     |
| treatment with linetole                      | 129 | inspection method for emission               | 197 |
| <u>Benzo(a) pyrene</u>                       |     | source of particulates                       | 195 |
| in air of American cities                    | 180 | <u>Filter(s), for gas cleaning</u>           | 186 |
| <u>Biological scientist</u>                  |     | <u>Fluoride(s), continuous analysis</u>      | 140 |
| in air pollution control                     | 192 | <u>Gas cleaning</u>                          |     |
| <u>Books</u>                                 |     | with bamboo layers                           | 193 |
| attorney's fees in workmen's                 |     | at high temperature                          | 186 |
| compensation                                 | 118 |                                              |     |
| occupational diseases and industrial         |     |                                              |     |
| medicine                                     | 117 |                                              |     |

|                                                    |     |                                                |     |
|----------------------------------------------------|-----|------------------------------------------------|-----|
| <u>Gas masks, for industrial safety</u>            | 205 | <u>Radiation (cont.)</u>                       |     |
| <u>Gloves, heat-resistant</u>                      | 206 | necrosis and skin cancer                       |     |
| <u>Gold, dermatitis from</u>                       | 133 | protective lead apron                          |     |
| <u>Health</u>                                      |     | <u>Radioactive, personnel decontamination</u>  |     |
| examinations of industrial workers                 | 121 | <u>Radioactivity</u>                           |     |
| survey, U. S. Natl.                                |     | removal from water supplies                    | 176 |
| acute conditions, seasonal variations              | 119 | <u>Radium, determination in urine</u>          | 171 |
| interim report on health insurance                 | 120 | <u>Silicosis</u>                               |     |
| <u>Incinerator(s), analysis of effluents</u>       | 194 | of the bone marrow                             | 157 |
| <u>Industrial medicine</u>                         |     | lipoprotein and protein content                | 158 |
| and occupational diseases (bk. rev.)               | 117 | <u>Stacks</u>                                  |     |
| <u>Lead</u>                                        |     | distribution of emission from                  | 178 |
| poisoning on firing ranges                         | 147 | recommendations on heights                     | 184 |
| tetraethyl poisoning with 8 deaths                 | 148 | <u>Sterilizer, ethylene oxide</u>              |     |
| <u>Liver cirrhosis and price of alcohol</u>        | 202 | testing efficiency                             | 132 |
| <u>Mental health and the worker</u>                | 122 | <u>Sulfates, inorganic and total</u>           |     |
| <u>Mercaptans, determination in air</u>            | 183 | determination in urine                         | 141 |
| <u>Mercurial intoxication, a review</u>            | 144 | <u>Sulfur dioxide</u>                          |     |
| <u>Mercury, determination in blood</u>             | 145 | determination in air                           | 182 |
| <u>Methyl chloride, microdetermination</u>         | 149 | monitoring with lead peroxide cylinders        | 181 |
| <u>Mini-Adak Analyzer, for fluorides</u>           | 140 | <u>Talc lungs, pathological anatomy</u>        | 160 |
| <u>Noise</u>                                       |     | <u>Tantalum-132, and cancer of the bladder</u> | 167 |
| control and reduction                              |     | <u>Tetanus, wound management</u>               | 131 |
| effect on work                                     | 166 | <u>Thallium, estimation in urine</u>           | 146 |
| criterion for evaluation                           | 164 | <u>Tobacco chewers, oral cancer</u>            | 130 |
| evaluation of exposure                             | 165 | <u>Triaryl phosphates, toxicity</u>            | 150 |
| <u>Odor(s), control in soap process</u>            | 198 | <u>Tricresylphosphate</u>                      |     |
| <u>Ozone, in air of Cincinnati</u>                 | 179 | Moroccan poisoning of 1959                     | 151 |
| <u>Plutonium, determination in urine</u>           | 177 | <u>Urinary sulfate ratio, determination</u>    | 141 |
| <u>Pneumatic tools</u>                             |     | <u>Vibrating tools</u>                         |     |
| bone and joint damage                              | 125 | bone and joint damage                          | 125 |
| effect on hands                                    | 124 | effect on hands                                | 124 |
| <u>Poisoning, epidemiology of accidental</u>       | 139 | <u>Waste disposal</u>                          |     |
| <u>Psychiatry</u>                                  |     | coffee wastes                                  | 209 |
| behavioral disturbances                            | 123 | organic contaminants in rivers                 | 207 |
| mental health and the worker                       | 122 | pickle liquor regeneration                     | 208 |
| <u>Radiation (ionizing, nuclear, x-rays, etc.)</u> |     | <u>Workmen's compensation</u>                  |     |
| damage to small intestine                          | 169 | attorneys' fees (bk. rev.)                     | 118 |
| effect on grafted and normal skin                  | 172 | <u>X-ray(s)</u>                                |     |
| food preservation                                  | 170 | control in weld radiography                    | 174 |
|                                                    |     | survey of units in Oregon                      | 168 |