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Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

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JANUARY, 1963

(Vol. 27, No. 1)

INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE -- PITTSBURGH 13, PA.

INDUSTRIAL HYGIENE FEATURES

The periodic evaluation of outpatients discussed in Abst. No. 847.

See Abst. No. 850 for the natural history of coronary atherosclerosis.

Abst. No. 852 discusses the occurrence of oral cancer.

Abst. No. 861 is concerned with the etiology of bronchogenic carcinoma.

See Abst. No. 866 for serologic surveys for selected zoonoses in Ohio veterinarians.

Information on dermatitis caused by Saran Wrap is given in Abst. No. 869.

Abst. No. 871 reviews dermatitis from epoxy resins.

Abst. No. 878 presents criteria for the evaluation of chemical toxicity.

Oxygen therapy in cyanide poisoning is the title of Abst. No. 880.

Fluorosis in cattle is investigated in Abst. No. 881.

Clinical and therapeutic aspects of kerosene poisoning are studied in Abst. No. 888.

Data on the successful treatment of malathion poisoning are given in Abst. No. 890.

A case of benign asbestos pleurisy is described in Abst. No. 895.

Abst. No. 909 reports on air sampling in plastic bags.

A code of safe practices for industrial scuba diving is given in Abst. No. 916.

Abst. No. 926 gives information on the employment of the mentally subnormal.

FOUNDATION FACTS

NEW MEMBER. The Foundation is pleased to add the name of Gypsum Association to its list of members.

Invitational programs for the 29th Annual Meeting have been mailed to the membership of the Foundation. Of particular interest to our members should be the following:

The 1st Management Session - Chronic Disease in Industry - which will explain the importance of preventive programs related to health.

The 2nd Management Session - Application of Toxicological Thresholds - will indicate the importance of competent industrial health consultation in the application of threshold and maximum standards.

The 3rd Management Session - concerned with an industrial emphysema claim will incorporate some of the findings of the Emphysema Symposium held at the Foundation on September 15 and 16 (see August Foundation Facts).

The Joint Professional-Technical Conference on Thursday morning includes the presentations on practical aspects of waste disposal, air conservation, beryllium toxicity, and legal papers on the current status of compensation legislation, hearing loss, and Walsh-Healey Act Standards.

The Concurrent Professional-Technical Conferences include many important and timely subjects which have been suggested by the membership and which relate to many fields of occupational health and safety.

The Business Meeting of the Foundation Membership at 11:20 a.m., October 21, will review past progress and outline future research and educational plans for Foundation activities. Members should plan to attend and to participate in our planning to the fullest extent possible.

Phosgene Meeting. As a result of a small exploratory discussion on Phosgene, September 17, consideration is being given to several industry-wide research projects under the guidance of the Chemical-Toxicological, Medical, and Engineering Committees. If sufficient interest develops, a Symposium may be held later in order to allow presentation of our findings.

Threshold Limit Values. A limited number of tear sheets from this issue of the Industrial Hygiene Digest will be available to Foundation member companies represented at the Annual Meeting. If you should need extra copies, therefore, please let us hear from you—while the supply lasts.



WILLIAM P. YANT

Industrial Hygiene Foundation regrettably informs its members of the sudden death of Dr. William P. Yant in New York City on January 29, 1963.

Dr. Yant, Research Consultant to the President of Mine Safety Appliances Company, was a member of the Board of Trustees of Industrial Hygiene Foundation since its inception in 1936, and Chairman of the Board from 1958-1961. He also served as a member of the Research Advisory Council and the Chemical-Toxicological Committees from 1946-1956.

A pioneer and internationally recognized authority in the field of industrial hygiene, he participated in the formation of Industrial Hygiene Foundation, and made unlimited contributions of his time, energy and experience to the progress of the Foundation. His strong, personal concern for the Foundation was a dominant element in the Foundation's achievements.

Dr. Yant's interest in industrial hygiene has been ascribed to his concern for "any activity which would lead to greater health, comfort and safety for human beings." His plans were large and as a result millions of workers in industry have benefited by his untiring efforts to safeguard their health. Industrial Hygiene Foundation and the entire field of industrial health has lost one of its staunchest supporters.

During his long career, Dr. Yant had 38 U.S. Patents and 28 Foreign Patents on safety and industrial instruments, equipments and methods. He authored 150 publications on the knowledge and practice of occupational health and safety. He was a member of the American Industrial Hygiene Association which he

DR. DANIEL C. BRAUN ACCEPTS CHAIRMANSHIP
OF I-H-F MEDICAL COMMITTEE



Industrial Hygiene Foundation is pleased to announce that Daniel C. Braun, M.D., has accepted the Chairmanship of its Medical Committee. He served as its Secretary from 1950-57.

Dr. Braun received his M.D. degree from the University of Pittsburgh School of Medicine in 1937, interned at Mercy Hospital, Pittsburgh, and has completed a number of postgraduate courses in industrial medicine, hygiene and toxicology at the University of Pittsburgh, Long Island College Medicine and Columbia University.

Dr. Braun was Medical Director of IHF from 1950-57. Prior to that he has been Medical Director for Pittsburgh Coal Co., serving subsequently as a consultant in occupational medicine for Pittsburgh Coal, Westinghouse Electric Corp., and other industrial firms in the Pittsburgh area. After leaving the Foundation, he became Plant Medical Director, Homestead District Works of U. S. Steel Corp., and is now Assistant Medical Director, divisions and associated subsidiaries of U. S. Steel.

Dr. Braun is a former director of the Industrial Medical Association and Past-President of the IMA of the Pittsburgh-Cleveland Area. He is certified in occupational medicine by the American Board of Preventive Medicine and is a Fellow of the Am. Coll. of Chest Physicians, Am. Academy of Occ. Med., Am. Public Health Assoc. and Pittsburgh Academy of Medicine. He is also a lecturer in occupational health at the Graduate School of Public Health, University of Pittsburgh.

EDITORIAL

HYGIENIC GUIDES

In the September issue of Industrial Hygiene Digest, the 1963 American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values were presented along with a review of available information on TLV's of electromagnetic radiation.

Bulletin No. 2 in the IHF Chemical—Toxicological Series is in distribution. It lists all publications of the American Industrial Hygiene Association (AIHA) Hygienic Guides Committee and also includes those which are in preparation or have been suggested to the AIHA Committee. The IHF bulletin includes a suggested format which can be used as a basis for preparation of information on any compounds not listed, or in suggesting revision of existing Hygienic Guides, where necessary.

The AIHA Hygienic Guides have been well received for the most part, and there is every indication that they will be published on an increasing number of industrial chemicals. In addition, the ACGIH Threshold Limits Committee is, of course, anxious to increase the number of values on its list.

Foundation members could make a significant contribution in furthering the work of both Committees by preparing and submitting proposals for Hygienic Guides on their chemical products, where there is adequate information available to do so. The Industrial Hygiene Foundation's Chemical-Toxicological Committee has agreed to review such material to insure the highest possible level of accuracy and coordination prior to forwarding to the AIHA Hygienic Guides Committee. Dr. C. P. Carpenter, Chairman of the Hygienic Guides Committee, has indicated his willingness to consider such material. The final publication should represent the best effort of our professional and technical community.

Member companies of IHF can thus assist in the publication of material on their products and, perhaps indirectly, on the setting of accurate Threshold Limit Values.

For both reasons, we feel sure that Foundation members will wish to participate in this joint Industrial Hygiene Foundation—American Industrial Hygiene Association activity.



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**TWENTY-EIGHTH
ANNUAL MEMBERSHIP MEETING**

October 23, 1963

and

SUMMARY OF 1963 ACTIVITIES

INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE - PITTSBURGH 13, PA.

INDUSTRIAL HYGIENE FOUNDATION OF AMERICA, INC.

MINUTES

MEETING OF MEMBERS

Pittsburgh, Pennsylvania
October 23, 1963

The Annual Meeting of the Members of the Industrial Hygiene Foundation of America, Inc., was held at Mellon Institute, Pittsburgh, Pennsylvania, on Wednesday, October 23, 1963, at 4:30 p.m., pursuant to notice. Dr. Blaine B. Wescott, Chairman of the Board of Trustees, presided.

Mr. T. C. Waters, who had been previously appointed by the Chairman to examine the proxies, reported that there were 151 companies represented by proxies that were in proper form and fully executed. On motion made and seconded, the proxies were approved. The member companies represented by proxy or in person constituted a quorum. A list of the member companies represented by proxies and a copy of the notice of the meeting and proxy sent to all members of the Corporation are on file in the Minute Book.

Since there were no objections or correction to the minutes which were mailed to all member companies following the October 25, 1962 meeting, a motion was passed to dispense with the reading of the minutes. The Chairman stated that the Minute Book was available and open at the meeting for inspection by members.

Dr. Wescott read the following statement in memory of Dr. William P. Yant:

"In Memory of William Parks Yant
Industrial Hygiene Foundation 1935 - 1963"

"William Parks Yant died at Grand Central Hospital, New York City, at 5:30 p.m., Tuesday, January 29, 1963. For many years, he had served as Research Consultant to the President of the Mine Safety Appliances Company; he also served as a member of the Research Advisory Council and Chemical-Toxicological Committee of the Industrial Hygiene Foundation of America, Inc.; since the organization of the Foundation in 1935, he served as a faithful member of the Board of Trustees and succeeded to become Chairman of the Board of Trustees from 1958-1961.

"Dr. Yant was a pioneer and internationally recognized authority in the field of industrial hygiene; he participated in the formation of the Industrial Hygiene Foundation of America, Inc., and made unlimited contributions of his time, energy and experience to the progress of the Foundation. His strong personal concern for the Foundation was a dominant element in the Foundation's achievements.

"His interest in industrial hygiene has been ascribed to his concern for "any activity which would lead to greater health, comfort and safety for human beings". His plans were large and as a result millions of workers in industry have benefited by his untiring efforts to safeguard their health.

"Dr. Yant received many honors in the distinguished service that he rendered to science. He served as chairman and councilor of various committees and sections devoted to his primary interest.

"He was married in 1933 to Elizabeth M. Grossman and is survived by three children, William Parks, Jr., a student at Ohio Northern University; Mrs. Gretchen Elizabeth Robinson of Ada, Ohio; and Susan Jane, a student at Pennsylvania State University; and one grandchild. His home was in Murrysville, Pennsylvania.

"His services have extended to all member companies and he has always discharged responsibilities assigned to him with exceptional ability, rugged honesty, and fidelity to the welfare of this Foundation and to industry. In his relationship with members, he has been an esteemed and valued personal friend and able business associate. His humility, character and attractive personality won for him the respect and affectionate regard of all with whom he came in contact, and it may well be said of him that he devoted his life and talents to the protection against illness of others and control and correction of industrial hazards to enable his fellow men to have better and safer conditions under which to perform their daily tasks.

"It is therefore fitting that we should record our recognition of our distinguished fellow member and regret with heartfelt sorrow his loss and commend his high character and kindly demeanor as an ideal of personal conduct and as an example to his fellowman.

"NOW, THEREFORE, BE IT RESOLVED that out of respect for the memory of our deceased friend and in recognition of his valued services to industry and to the Foundation, we direct that these resolutions be spread upon the minutes of this meeting and that a copy of them be sent to the family of William Parks Yant as a token of the sympathy and regard of the members of this Foundation."

A motion was made, seconded, and unanimously carried that this resolution be adopted.

The Chairman called on Mr. E. K. Davison, a member of the Nominating Committee, to report on this Committee's recommendations pertaining to: (1) The number of members of the Board for the year 1964, and (2) A slate of nominations for members of the Board to serve during the year 1964. Mr. Davison moved that the number of Trustees be set at 30. This motion was seconded and passed. He then submitted the names of the following persons as nominees for election to membership on the Board of Trustees.

Earle T. Andrews
Pennsylvania Glass Sand Corporation

Chester L. Arnold
Stauffer Chemical Company

Dr. Paul W. Bachman
Koppers Company, Inc.

Dr. Anna M. Baetjer
Johns Hopkins University

Robert D. Blasier
Westinghouse Electric Corporation

M. F. Crass, Jr.
Manufacturing Chemists Association

Lawrence A. Coleman
Allied Chemical Corporation

E. K. Davison
Davison Sand & Gravel Company

Dr. Robert T. P. deTreville
Industrial Hygiene Foundation

Andrew Fletcher
St. Joseph Lead Company

Theodore F. Hatch
University of Pittsburgh

W. G. Hazard
Owens-Illinois Glass Company

Andrew Kalmykow
Assn. of Casualty & Surety Companies

Harold S. McFarland
General Motors Corporation

Dr. Robert B. O'Connor
United States Steel Corporation

Robert T. Ross
Ford Motor Company

Elgin D. Sallee
American Can Company

Dr. O. A. Sander
Marquette University

Dr. John F. Shrouts
General Mills, Inc.

Dr. G. R. Simmons
Western Electric Company

Dr. Kenneth W. Smith
Johns-Manville Corporation

Leo Teplow
American Iron & Steel Institute

Dr. Joseph F. Treon
Atlas Chemical Industries, Inc.

Theodore C. Waters
Miles & Stockbridge

Dr. G. Arthur Webb
Mellon Institute

Dr. Blaine B. Wescott
MPC Corporation

Paul S. Wise
American Mutual Insurance Alliance

Dr. John A. Zapp, Jr.
E. I. du Pont de Nemours & Company

There being no other nominations, a motion was made, seconded and passed unanimously that the persons named in the report of the Nominating Committee be elected to serve on the Board of Trustees for the year 1964.

The Chairman called upon Mr. T. F. Hatch to submit his report as Treasurer of the Foundation. Mr. Hatch summarized the financial statement pointing out that, by using actual figures to September 30 and estimating to December 31, we expect to end the year 1963 with total cash and savings of about \$89,965.08, and will have an estimated excess expense over income of \$13,073.65. With regard to membership in 1963, five companies joined the Foundation, one member increased their dues, and nine members resigned, thus leaving us with a decrease in dues of \$1,225.00 as of September 30. Based upon anticipated income and expense for 1964, we propose a total budget of \$180,500.00. Because of several contracts with the National Institutes of Health, which are conducted through Mellon Institute, the Foundation will receive salary credits amounting to about \$32,000.00. Mr. Hatch moved that a contract be approved for 1964 between Mellon Institute and Industrial Hygiene Foundation in the sum of \$139,000.00 covering the major cost of operation of the Foundation during the year 1964. This motion was seconded and unanimously passed. Following presentation of the Treasurer's report, it was moved, seconded, and passed that the Treasurer's report be accepted.

The Chairman explained that the Foundation, since its inception, has received continuous financial support from Mellon Institute. From 1935 until 1958, this amount was significantly higher than at present, but a review of experience indicates that an average grant of about \$30,000.00 has been made to the Foundation each year since 1958. It has been the generous supplementary contribution from Mellon Institute which has enabled IHF to continue its operations for 28 years without modification of its dues structure. It was taken into account by the Board in 1963 that it

would be necessary to operate at a deficit for perhaps two to three years in order to reorganize and overhaul the Foundation in an attempt to breathe new life into it. The 1963 deficit was, therefore, anticipated.

Dr. deTreville then read his report as Managing Director of the Foundation. (A copy of his remarks entitled "Foundation Facts" is included in this report.)

The Chairman then opened the meeting for general discussion.

Dr. deTreville reported that the Foundation's Technical Committees had all held luncheon meetings that day and had advised him that they would like time to plan a full, highly technical program for next year. This will be done, even if it is found necessary to extend the meeting for an additional day in order to respond to the needs of our members.

There being no further business to come before this Membership Meeting, the meeting was adjourned at 5:00 p.m.

E. K. Davison
Secretary

FOUNDATION FACTS*

by

Robert T. P. deTreville, M.D., Managing Director
Industrial Hygiene Foundation

I. Organization

Industrial Hygiene Foundation of America, Inc., is a non-profit research association of industries for advancing industrial hygiene and occupational health, improving working conditions and bettering human relations. An independent research fellowship at Mellon Institute, Pittsburgh, IHF is made up of almost 400 member companies. These companies manage the Foundation under a constitution and Code of Regulations, by means of a Board of Trustees. The Trustees are drawn chiefly from industrial management of the membership, but include representatives from universities, as shown in the program for the Annual Meeting this year. The work of the Foundation is carried on by a Managing Director and staff, consultants, and committees: Chemical-Toxicological, Engineering, Legal, Medical, and Nursing.

II. Functions

The Office of the Managing Director administers IHF programs, budget, membership applications, correspondence, contracting, public relations and personnel under the supervision of the Board of Trustees and within general administrative policies of Mellon Institute, and is responsible for maintaining high professional, technical, and ethical standards, and for assuring that the work of the Foundation proceeds in a businesslike and effective manner toward accomplishment of stated goals. The Managing Director is assisted by professional and technical staff members.

Research Laboratory Division - Dr. Paul Gross, Research Pathologist, provides highly specialized scientific advice in the evaluation of research needs of member companies and in the design of experiments for solving specific problems. He also initiates and designs investigations for submission to the National Institutes of Health. He supervises the IHF Research Lab and interprets the results of pathological and toxicological studies, and provides liaison with other leading scientists. He is assisted in all research functions by Mr. James M. McNerney, Research Toxicologist, who administers projects and personnel of the lab.

In our Engineering and Analytical Division, Mr. William J. Schreiber, Industrial Hygiene Engineer, performs industrial hygiene surveys, including stack samples, in-plant; performs physical and chemical analyses of samples collected. Provides technical assistance to

* Presented at 28th Annual Meeting of Industrial Hygiene Foundation, October 23-24, 1963, Pittsburgh, Pa.

member companies. Arranges highly technical assistance from Mellon Institute or other specialized labs as required. Studies performed include noise, radiation, heat, chemical and dust measurements. Assistance is provided in design of proper controls in new plant or process design. Provides industrial hygiene engineering support to Mellon Institute in certain research projects. Provides liaison with other engineers and scientists in fields of atmospheric pollution control, noise abatement, stream pollution control, etc.

In the Technical Library Division, Dr. John Metschl, Editor, prepares the monthly Industrial Hygiene Digest by abstracting, classifying and editing articles from scientific and technical journals. He maintains the technical literature file and searches these files for information required by member company representatives. He also maintains liaison with other such services in industry, government, private institutions and universities.

III. Services Provided during 1963

A. Regular services provided by IHF have been:

- 1) Industrial Hygiene Digest contains approximately 100 abstracts each month which are grouped by subject. We are attempting to broaden the scope of the Digest by introducing special editorials and full-length articles which we believe will be of particular interest to management. Examples of these appeared in the Industrial Hygiene Digest during the year.
- 2) Bulletins - This year, three new bulletins were issued in our special series: Legal Bulletin No. 4 on the Current Status of Compensation for Pneumoconioses; Engineering Bulletin No. 5 on International Audiometric Zero; and Chemical-Toxicological Bulletin No. 2 on Hygienic Guides. The Transactions of the 27th Annual Meeting were published as the March 1963 issue of the Archives of Environmental Health and were distributed to all members.
- 3) There continued to be requests for information on a wide range of subjects. One such inquiry was received on electromagnetic radiation, and resulted in the supplement to the American Conference of Governmental Industrial Hygienists Threshold Limit Values published in the September Digest. Representatives of four industries met with us to propose or review industry-wide research projects. Two members requested our coordination on products sales brochures regarding health hazard controls. Another member requested coordination on a training film on industrial hygiene.
- 4) Seminars and training programs - Seminars are being prepared for two institutes on prevention of silicosis and welding hazards. Because of availability of training programs in the Public Health Service, it was not considered necessary to hold the basic course in industrial

hygiene this year. However, special training on highly technical aspects of industrial hygiene and air pollution control was conducted for one member company and for several IHF consultants.

B. Research performed by IHF has been in the following general areas:

1) Basic and applied toxicological research - The basic research undertaken by the Foundation belongs in three categories: that sponsored by the National Institutes of Health, that sponsored by industry, and that which is unsponsored.

Most of our basic research has been and is being sponsored by the National Institutes of Health. One of the problems under investigation is concerned with the conditions or factors that govern the rate at which the lungs cleanse themselves of inhaled dust. Our working hypothesis is that adequate respiratory excursions of the lung tissue are necessary for the self-cleaning mechanism by which the respiratory tract removes approximately 98% of the inhaled dust. A second project is concerned with the study of a method for the production of experimental lung cancer which could serve as a model for determining the lung cancer producing hazard of certain industrial chemicals. Although we have been successful in producing lung cancers in animals, we do not believe that the method is sufficiently sensitive at present. A third investigation sponsored by the NIH deals with the factors involved in spontaneous regression of chronic pneumonitis, using experimentally produced early silicosis as a model. The fourth and last study under this category is concerned with the relationship which has been found in the asbestos textile industry between lung cancer and asbestosis.

At the present time, we have one investigation sponsored by industry. The object of this study has been to determine if dust deposits in the lungs add a measurable functional handicap to lungs which have been impaired by reduced respiratory excursions such as is seen in emphysema or which are edematous as in congestive heart failure.

The unsponsored research has been performed in part in cooperation with the Graduate School of Public Health of the University of Pittsburgh and with Dr. H. E. Stokinger of the Public Health Service in Cincinnati. The problem studied is the basic response of the respiratory membrane to irritants in very low concentrations.

2) Applied toxicological research - Range-finding toxicity tests have been performed on about a dozen chemical compounds. The toxicology laboratory has also performed an evaluation of a potential process hazard and of an equipment development hazard; also dermatological studies of sensitization and primary irritation as well as chemical carcinogenicity.

3) The Engineering and Analytical Division of the Foundation has performed numerous field studies regarding atmospheric and industrial hygiene; air pollutant surveys, industrial

hygiene surveys, industrial hygiene inspection surveys, industrial hygiene consultation regarding process hazard evaluation and control; clay mine dust survey, glass works dust survey, atmospheric gaseous pollutant survey, industrial hygiene survey training in the field, evaluation of potential beryllium hazard in a new process, stack sampling for particulate matter and ammonia in a mixed fertilizer granulating plant; and size separation and x-ray diffraction analysis of dust samples.

4) Bibliographic research was performed on several chemical compounds.

5) Epidemiological studies were undertaken on an industry-wide basis in conjunction with several member companies.

In conclusion, during 1963, IHF services have been designed to meet the needs of the membership, as requested; this policy will continue in 1964. Through participation with other agencies active in the field of occupational health, and with the competent assistance of IHF committees, we hope to develop certain programs which, in addition to being of benefit to our membership, will further advance the standards of practice of occupational health, more effectively utilizing our national resources in accomplishing the Foundation's mission.

OFFICERS AND MEMBERS OF I-H-F BOARD OF TRUSTEES FOR 1964

Chairman: Dr. B. B. Wescott
Vice Chairman: Dr. P. W. Bachman
Secretary: Mr. E. K. Davison
Treasurer: Mr. T. F. Hatch
Managing Director: Dr. R. T. P. deTreville
Legal Counsel: Mr. T. C. Waters

Earle T. Andrews, President
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Vice President, Industrial Relations
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Box 4055, Pittsburgh, Pa. 15201

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Graduate School of Public Health
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Industrial Relations Division
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Owens-Illinois Glass Bldg., Toledo, Ohio 43601

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Assoc. of Casualty & Surety Companies
110 William St., New York, N. Y. 10038

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Director of Personnel Services
General Motors Corporation
General Motors Bldg., Detroit, Mich. 48222

Dr. Robert B. O'Connor
Vice President for Health Services
United States Steel Corporation
525 William Penn Place, Pittsburgh, Pa. 15219

Robert T. Ross, Mgr., Employee Services
Ford Motor Company
The American Road, Dearborn, Mich.

Elgin D. Sallee, Mgr. of Safety, Industrial
Hygiene, Employment & Plant Training
American Can Company
100 Park Ave., New York, N. Y. 10017

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(Marquette University School of Medicine)
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General Mills, Inc.
9200 Wayzata Blvd., Minneapolis, Minn. 55426

Dr. G. R. Simmons
Director of Research and Development
Western Electric Company
P. O. Box 900, Princeton, New Jersey

Dr. Kenneth W. Smith, Medical Director
Johns-Manville Corporation
22 East 40th St., New York, N. Y. 10016

Leo Teplow, Assistant Vice President
American Iron and Steel Institute
150 East 42nd St., New York, N. Y. 10017

Dr. Joseph F. Treon, Manager
Biological Sciences Section
Atlas Chemical Industries, Inc.
Wilmington, Delaware 19899

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Miles & Stockbridge
10 Light Street, Baltimore, Md. 21202

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Director of Administration
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MPC Corporation
4400 Fifth Ave., Pittsburgh, Pa. 15213

Dr. John A. Zapp, Jr., Director
Haskell Laboratory
E. I. du Pont de Nemours & Company
Wilmington, Delaware 19898

TECHNICAL COMMITTEES

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WILLIAM J. SCHREIBEIS, Secretary
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Westinghouse Electric Corporation
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Lumbermens Mutual Casualty Company
GEORGE M. WILKENING
Bell Telephone Laboratories

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JAMES M. McNERNEY, Secretary
Industrial Hygiene Foundation
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Reaction Motors Division,
Thiokol Chemical Corporation
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Mellon Institute
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General Electric Company
HAROLD R. HOYLE
Dow Chemical Company
J. C. RADCLIFFE
Ford Motor Company
GEORGE C. REED
Minneapolis-Honeywell Regulator Co.
CLYDE C. RUDDICK
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ELGIN D. SALLEE
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U. S. Public Health Service
WILLIAM J. WISWESSER
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E. I. du Pont de Nemours & Co.

Nursing Committee

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Jones & Laughlin Steel Company
JEAN W. GRAY, Acting Secretary
U. S. Public Health Service
MARIE C. GOIK
University of Pittsburgh, GSPH
BEDONNA JACOBS
Allegheny County Health Department
JEAN KARBUS
American Can Company
WINIFRED McLANAHAN
University of Pittsburgh, GSPH
ALDA SICA
United States Steel Corporation

Mrs. Lee reports that the Nursing Committee, now in the process of formation, will be composed chiefly of Supervisory Nurses at IHF member companies plus selected expert consultants in special fields such as nursing training. Official membership will be kept to ten. There are still several spaces to be filled. Foundation member companies who have a chief nurse and wish to be represented by her on this Committee are invited to communicate with Mrs. Lee c/o the Foundation. Individuals not appointed this year will be advised of progress and considered for membership at a later date.

Legal Committee

THEODORE C. WATERS, Chairman
Miles & Stockbridge
ANDREW KALMYKOW, Secretary
Assn. of Casualty & Surety Companies
OLIVER CLAYTON
Humble Oil & Refining Company
LAWRENCE A. COLEMAN
Allied Chemical Corporation
WILLIAM C. HARTMAN
Squire, Sanders & Dempsey
THEODORE HETZLER, Jr.
National Assn. of Mutual Casualty Cos.
JAMES L. HILL
Ford Motor Company
EDWARD E. KUEBLER
Kuebler & DelDeo
ROBERT B. RADY
Republic Steel Corporation
C. L. SHECKLER
Johns-Manville Corporation
DOUGLAS SOUTAR
American Smelting & Refining Company
D. W. STITT
Continental Can Company, Inc.
FRANK C. WACHTER
Pennsylvania Glass Sand Corporation
PAUL J. WINSHEL
Reed, Smith, Shaw & McClay

Medical Committee

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Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

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(Vol. 26, No. 1)

INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE -- PITTSBURGH 13, PA.

INDUSTRIAL HYGIENE TRAINING COURSE

Conducted by

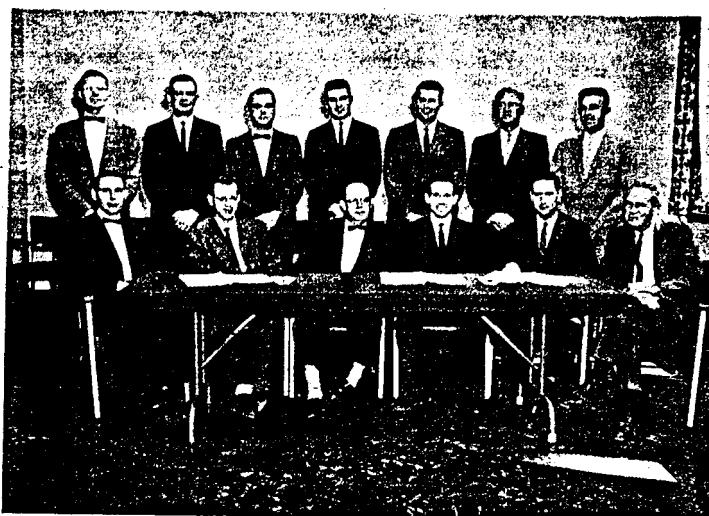
INDUSTRIAL HYGIENE FOUNDATION

and

OCCUPATIONAL HEALTH RESEARCH AND TRAINING FACILITY
UNITED STATES PUBLIC HEALTH SERVICE

at

Mellon Institute, Pittsburgh, Pa., September 10-21, 1962



Engineers in attendance at the third annual Industrial Hygiene Training Course.

Seated - Left to Right: G. M. Reynolds, Hazleton Laboratories, Inc.; R. W. Bloomquist, General Mills, Inc.; G. L. Dietz, Merck & Company, Inc.; D. A. Cohagan, Western Electric Company; R. H. Snow, Western Electric Company; and G. C. Frisby, Kennecott Copper Corp.

Standing - Left to Right: R. B. Hubbard, Maryland Casualty Company; J. M. Plunkett, Aluminum Company of America; H. W. Rapp, Jr., The Travelers Insurance Company; B. G. Sykes, Jr., Pennsylvania Glass Sand Company; R. A. Hudspeth, Kennecott Copper Corp.; F. W. Sandell, Johns-Manville Products Corp.; and R. P. Hibbard, The Boeing Company.

(Also attended some of the courses, but not in picture: Eugene Bañry (Alternate: A. T. Sabo), of Nuclear Materials & Equipment Corp.).

This was the third training course conducted by the Foundation in cooperation with the United States Public Health Service, for industrial hygiene engineers. It too, proved to be very successful and the results most gratifying. It was an intensive two-weeks devoted to laboratory work, lectures, films, in-plant tours, and homework assignments. The students individually prepared known concentrations of gases and vapors, calibrated gas sampling instruments, used gas detectors, made chemical analyses and ventilation measurements. Lectures and demonstrations covered such subjects as pneumoconioses, toxicology, radiation, noise, and industrial hygiene practice. The course was completed with a final examination followed by presentation of Certificates of Training. The business-like and industrious attitude of the students was highly commendable. Again, we feel that the course served a useful purpose and provided the participants with a knowledge and experience which will serve them well. Applications are being accepted for the fourth training course to be held in September, 1963.

INDUSTRIAL HYGIENE FEATURES

Tuberculosis in an industrial plant is discussed in Abst. No. 20.

Abst. No. 21 reports on the concept of organizing pneumonia.

For information on mysterious "mush-room miasma" see Abst. No. 24.

Details on the metabolic and pathologic changes in acute pneumonitis from nickel carbonyl are presented in Abst. No. 37.

Consult Abst. No. 43 for data on the treatment of methanol poisoning by extracorporeal dialysis.

A study of the toxicity of vinyl chloride as determined by repeated exposure to laboratory animals is presented in Abst. No. 45.

Abst. No. 52 described a compact cascade impactor for field survey sampling.

For a discussion on the toxicity of precipitated silica see Abst. No. 56.

An account of pneumoconiosis due to Fuller's earth is given in Abst. No. 59.

Consult Abst. No. 60 for a summary on information relating to toxic fumes from shotfiring in coal mines.

For observations on the late effects of internally deposited mixtures of mesothorium and radium in dial painters see Abst. No. 68.

Abst. No. 86 describes an instrumentation system for olefin analysis at ambient concentrations.

FOUNDATION FACTS

NEWLY APPOINTED MEMBERS OF CHEMICAL-TOXICOLOGICAL COMMITTEE:

Mr. H. M. Bowman, Reaction Motors Division, Thiokol Chemical Corporation
Dr. C. P. Carpenter, Chemical Hygiene Fellowship, Mellon Institute
Mr. J. C. Radcliffe, Ford Motor Company

THE ANNUAL INDEX to Industrial Hygiene Digest for 1961 is being mailed to members along with this issue of the publication. It provides a quick reference to the 1,239 abstracts of literature on industrial health which appeared in the Digest last year. Also being mailed is a SUPPLEMENT TO 1961 EDITION OF LIST OF PERIODICALS ABSTRACTED IN INDUSTRIAL HYGIENE DIGEST.

A THIRD INDUSTRIAL HYGIENE ENGINEERING TRAINING COURSE will be given by Industrial Hygiene Foundation and the Occupational Health Research and Training Facility of U. S. Public Health Service from September 10-21, 1962, at Mellon Institute, Pittsburgh, Pa. Since the enrollment is limited to 12 persons, we urge all companies who wish to send an engineer or chemist for this training to notify us as soon as possible. The tuition is \$150.

THE FOUNDATION HAS RECEIVED A TWO-YEAR GRANT from the Occupational Health Division, U.S. Public Health Service for a research program "Studies on Pulmonary Clearance Mechanism". The project will be conducted in our toxicology laboratory under the direction of Dr. Paul Gross.

DR. EDWARD R. WEIDLEIN, former President of Mellon Institute, has received the 1961 William Procter Prize for scientific achievement. Dr. Weidlein's award signalizes a career of more than 50 years during which he has become one of the world's dominant figures in industrial research.

INDUSTRIAL HYGIENE FEATURES

Aviation medicine consultation problem cases is the topic of Abst. No. 115.

Abst. No. 116 discusses a program of industrial first aid.

Acute psychiatric problems in industry is the concern of Abst. No. 120.

Abst. No. 140 reports on the approximate oral toxicity in rats of selected household products.

Information on acute sulfur dioxide toxicity and the effects of histamine and histamine liberation is presented in Abst. No. 142.

For data on chemical pneumonitis from inhalation of zinc chloride consult Abst. No. 143.

Abst. No. 148 discusses fingernail cystine content in chronic mercury exposure.

Nonoccupational diffuse pulmonary fibrosis: report of a case in an asbestos worker is the title of Abst. No. 161.

Abst. No. 162 reports on a case of fiber glass pneumoconiosis.

A fatal case of aspiration of talcum powder by a child is described in Abst. No. 163.

A description of combustible gas detectors is given in Abst. No. 185.

Air flow requirements for underground parking garages are evaluated in Abst. No. 186.

FOUNDATION FACTS

I-H-F BOARD OF TRUSTEES held a special meeting on February 8, at the Foundation's headquarters. A permanent Policy and Planning Committee was established and a Program Committee was appointed to plan the Management Session of the Annual Meeting.

I-H-F ENGINEERING COMMITTEE met at the Foundation's headquarters on February 7, to discuss plans for the Engineering Conference of the Foundation's 27th Annual Meeting to be held on October 24-25, at Mellon Institute.

A RESEARCH PROGRAM ON THE PATHOGENESIS OF EXPERIMENTAL TUBERCULOSILICOSIS was recently completed under the direction of Dr. Paul Gross. This three-year study, sponsored by the National Institutes of Health, was concerned with quantitation of the dust mobilized and cleared from the lungs as a result of induced pulmonary inflammations. It was found that in the presence of a violent inflammation much dust is removed from the lungs, whereas little dust is removed in the presence of an indolent inflammation.

DR. H. H. SCHRENK, the Foundation's Managing Director, attended the Pennsylvania State Chamber of Commerce Pollution Abatement Committee meeting in Harrisburg on February 9. This Committee covers both water and air pollution.

NEW REPRINTS available from the Foundation upon request are: "The Concept of Organizing Pneumonia" by Paul Gross and E. J. Benz, Arch. Pathol. 72, 607-619 (Dec. 1961); and "Human-Factors Engineering and Safety Research" by Theodore F. Hatch, J. Occ. Med. 4, 1-5 (Jan. 1962).

DR. A. G. KAMMER, Head, Department of Occupational Health, Graduate School of Public Health, University of Pittsburgh, died suddenly from a heart attack on January 31. Dr. Kammer had been an active member of the Foundation's Medical Committee from 1947 until 1959.

INDUSTRIAL HYGIENE FEATURES

Emergency care in industry is discussed in Abst. No. 219.

For voluntary proctosigmoidoscopic examinations in an industrial setting consult Abst. No. 220.

Abst. No. 224 presents current problems of the pneumonias.

Abst. No. 227 reports on the relationship between coronary heart disease and the presence of certain physical characteristics.

Information on the diffusing capacity of cigarette smokers is presented in Abst. No. 231.

Smoking and the health of older men is the topic of Abst. No. 232.

See Abst. No. 234 for a 5-year study of staphylococcal infections.

The topic of Abst. No. 235 is deaths and illness from bronchitis, emphysema and asthma.

A report on contact eczema caused by true teak is given in Abst. No. 237.

Lead poisoning in demolition work is the title of Abst. No. 251.

Cataract development in rats fed commercial quercetin is investigated in Abst. No. 253.

Abst. No. 262 examines some pharmacological actions of cotton dust and other vegetable fibers.

Consult Abst. No. 275 for data on radio-dermatitis from diffraction apparatus.

Carcinoma of the skin in a bovine exposed to radioactive fallout is described in Abst. No. 282.

For a discussion on the engineering aspects of air pollution see Abst. No. 293.

Basic information on injuries and accidents at a missile test center is presented in Abst. No. 298.

FOUNDATION FACTS

NEW MEMBER. The Foundation welcomes to membership Western Electric Company, Inc.

NEW I-H-F COMMITTEE. A Program Committee for the Management Session of Annual Meetings was established by the Board of Trustees at its meeting on February 8. This Committee will select speakers and subjects targeted to management to attract greater general management's participation in the programs. The following Trustees will serve on this Committee:

Mr. Leo Teplow, American Iron & Steel Institute (Chairman)
Dr. Paul W. Bachman, Koppers Company
Mr. E. T. Klassen, American Can Company
Dr. Robert B. O'Connor, United States Steel Corp.

TRANSACTIONS OF 26th ANNUAL MEETING of Industrial Hygiene Foundation held in Pittsburgh, Pa., on October 25-26, 1961, have been published as the complete March 1962 issue of the Archives of Environmental Health. Copies of these Transactions are now being mailed to all I-H-F members.

DR. H. H. SCHRENK attended a meeting of the Industrial Hygiene Roundtable at Oberlin, Ohio, March 23 through 25.

NEW REPRINT available from the Foundation upon request. "Nonoccupational Diffuse Pulmonary Fibrosis. A Report of A Case in An Asbestos Worker." By Dr. Paul Cartier and Dr. Paul Gross. Arch. Environmental Health 4, 73-80 (Jan. 1962).

Oct. 1962

INDUSTRIAL HYGIENE FEATURES

The pulmonary evaluation of surgical patients is discussed in Abst. No. 914.

Do heart disease patients benefit from work recommendations? Abst. No. 915.

Abst. No. 918 is concerned with the effects of smoking.

For an account of office management of common medical conditions consult Abst. No. 925.

Abst. No. 929 presents information on the occupational toxicity of cultivated flowers.

Abst. No. 934 reports on hydrogen sulfide intoxication concerning two cases of nonfatal poisoning.

Chromyl chloride—a possible important industrial air contaminant is investigated in Abst. No. 937.

Lead poisoning and hemaglobin synthesis are reviewed in Abst. No. 940.

An account of the consequences of ethylene glycol poisoning is given in Abst. No. 941.

Four cases of methyl alcohol poisoning are described in Abst. No. 942.

For a discussion on the toxicity of ingested hexachlorophene, See Abst. No. 947.

Data on the basic pathology of pneumoconiosis are presented in Abst. No. 950.

Pneumoconiosis case-finding in industry and detection of sources of exposure is the title of Abst. No. 958.

Information regarding the directional dependence of air samplers is given in Abst. No. 960.

A genetic survey of the offsprings of x-ray workers is given in Abst. No. 972.

For a discussion on the realities of rehabilitation, consult Abst. No. 992.

FOUNDATION FACTS

27th ANNUAL MEETING THIS MONTH. We are looking forward to having representatives from all our member companies with us on October 24 and 25 for our 27th Annual Meeting. Advance registration promises peak attendance. We feel certain that with the broad scope of subject matter and the distinguished roster of speakers that this meeting merits the interest and enthusiasm expressed by the membership. The officers of the Foundation also have a full program, with meetings scheduled for the Executive Committee and the Board of Trustees.

NEW MEMBERS. The Foundation is pleased to announce two new members:

International Research and Development Corporation
Louisiana Ordnance Plant, Remington Rand Div., Sperry Rand Corp.

DR. BLAINE B. WESCOTT, Chairman, I-H-F Board of Trustees, was awarded an honorary Doctor of Science Degree at the University of Pittsburgh's 175th Anniversary Alumni Honors Convocation on September 17.

THRESHOLD LIMIT VALUES. The Threshold Limit Values for 1962, adopted by the American Conference of Governmental Industrial Hygienists at their 24th Annual Meeting in Washington, D.C., on May 13-15, appear in this issue of the Digest. Additional copies are available upon request.

INDUSTRIAL HYGIENE FEATURES

Abst. No. 645 is concerned with suicide during productive years—an industrial problem.

Sudden death from coronary disease is the topic of Abst. No. 653.

Abst. No. 656 discusses total rehabilitation in heart disease.

Abst. No. 664 investigates dermatologic problems in compensation medicine—treatment and prognosis.

Thermographic assessment of burns and frostbite is the title of Abst. No. 667.

Consult Abst. No. 669 for data on food additives legislation and food technology; industry's viewpoint on effects of legislation.

Legal considerations in drafting warning labels are presented in Abst. No. 670.

Lead poisoning in scrap-metal workers is discussed in Abst. No. 676.

See Abst. No. 679 for a case report on a cerebral tumor in a lead worker.

A health hazard associated with epoxy-resin concrete dust is investigated in Abst. No. 685.

Abst. No. 696 gives a discussion on silicosis in hardrock miners in Ontario—the problem and its prevention.

Carbon pneumoconiosis in the rubber industry is described in Abst. No. 700.

The objective of Abst. No. 702 is a periodic search for cancer in the carbon black industry.

Consult Abst. No. 711 for the combined action of cigarette tar and beta radiation on mice.

Data on the lead content of the atmosphere are given in Abst. No. 717.

Contact lenses—threat to vision? is the title of Abst. No. 731.

FOUNDATION FACTS

NEW MEMBER. The Foundation welcomes to membership Westinghouse Brake and Signal Company Ltd., England.

NEW PRESIDENT OF MELLON INSTITUTE. Dr. Paul Clifford Cross of the University of Washington (Seattle) has been named President and Chief Executive Officer of Mellon Institute. He also was elected a Trustee of the Institute and expects to assume his new responsibilities September 1.

THRESHOLD LIMIT VALUES. The Threshold Limit Values for 1961, adopted by the American Conference of Governmental Industrial Hygienists, appear in this issue of the Digest.

NEW REPRINTS. "The Mortality from Sublethal Pulmonary Edema Superimposed upon Pneumoconiosis or Atelectasis" by Paul Gross, M. L. Westrick and J. M. McNerney. *Am. Indust. Hyg. Assn. J.* 22, 90 (Apr. 1961), and "Autocatalysis of Pulmonary Edema" by Paul Gross, M. L. Westrick and J. M. McNerney. *J. Occ. Med.* 3, 258 (May 1961). Reprints are available from the Foundation upon request.

26th ANNUAL MEETING

OCTOBER 25-26, 1961

INDUSTRIAL HYGIENE FEATURES

See Abst. No. 634 for details on the disinfection of the hands of surgeons and nurses.

The use and abuse of contact lenses is the topic of Abst. No. 636.

Information on the vision, visual acuity, and ocular refraction of young men is given in Abst. No. 637.

The influence of tropical weather on cardiac output is treated in Abst. No. 638.

For the neurological aspects of low back pain see Abst. No. 643.

A discussion on smoking and personality is given in Abst. No. 645.

Oil folliculitis, a study of 200 men employed in an engineering factory is the title of Abst. No. 649.

Data on an outbreak of sporotrichosis in Florida are presented in Abst. No. 650.

Ozone's role in chemistry and technology is discussed in Abst. No. 660.

Abst. No. 661 is concerned with studies on the chemical forms of urinary lead.

For the physical aspects of dust counting consult Abst. No. 671.

How did the term "pneumonokoniosis" originate? Abst. No. 674 tells you.

Pneumoconiosis in makers of artificial grinding wheels is the topic of Abst. No. 678.

Abst. No. 684 presents a report on diffuse lung lesions that mimic pneumoconiosis.

Abst. No. 689 gives a critique of our present noise control engineering efforts and accomplishments.

Abst. No. 706 is concerned with nitrogen oxide formation in the autoignition of liquid fuel sprays.

FOUNDATION FACTS

DR. GROSS PRESENTS PAPER. Dr. Paul Gross, the Foundation's Research Pathologist, presented a paper on "Autocatalysis of Pulmonary Edema", on June 10, 1960 at the Third Conference on Research in Emphysema at Aspen, Colorado.

THRESHOLD LIMIT VALUES. The Threshold Limit Values for 1960, adopted by the American Conference of Governmental Industrial Hygienists, appear in this issue of the Digest. Nine substances were changed from the Tentative List to the Recommended List and eight new substances were placed on the Tentative List. The value for chlorobromomethane was changed from 400 to 200 ppm and manganese from 6 to 5 milligrams per cubic meter. Cyclopropane was removed from the list as lack of published data did not justify previous listed value.

NEW REPRINT. "An Immunologic Approach to the Pneumoconiosis", by Paul Gross, M.D. A.M.A. Arch. Ind. Health, 21, 228-232 (March 1960). This reprint is available from the Foundation upon request.

SILVER ANNIVERSARY MEETING

OCTOBER 26 - 27, 1960

INDUSTRIAL HYGIENE FEATURES

Litigation breeders in industrial medicine are discussed in Abst. No. 990.

The disease concept of alcoholism is the subject of Abst. No. 993.

The topic of Abst. No. 997 is the treatment of low back pain.

For a series of papers concerned with epilepsy see Abst. Nos. 998, 999, and 1000.

See Abst. No. 1005 for changes in the ten commonest dermatoses in private practice.

A discussion on gamma-globulin therapy in chronic staphylococcic dermatoses is presented in Abst. No. 1007.

For hazards in the manufacture and use of plastics see Abst. No. 1010.

The subject of Abst. No. 1011 is the toxicity of boron oxide.

Abst. No. 1015 is concerned with experimental cancers in rats produced by chromium compounds.

Information on the biochemical mechanisms in chronic carbon disulfide poisoning is contained in Abst. No. 1024.

Farmer's lung in mushroom workers is the objective of Abst. No. 1028.

See Abst. No. 1040 for details on the medical problems of shift-work.

Data on an improved cascade impactor measuring aerosol particle sizes are given in Abst. No. 1060.

Considered in Abst. No. 1064 are the veterinary aspects of air pollution.

The theme of Abst. No. 1072 is how to improve safety through organization.

Details on laboratory hoods are given in Abst. Nos. 1076 and 1077.

FOUNDATION FACTS

NEW TRUSTEE ELECTED TO I-H-F BOARD. Mr. Newell R. Johnson, General Manager of the American Mutual Insurance Alliance, has been elected to the Board of Trustees of the Industrial Hygiene Foundation.

THRESHOLD LIMIT VALUES. The Threshold Limit Values for 1959, adopted by the American Conference of Governmental Industrial Hygienists, appear in this issue of the Digest. The limit value for bromine was changed from 1.0 to 0.1 ppm, chloroform from 100 to 50 ppm, and chloropicrin from 1.0 to 0.1 ppm. The list now contains 250 compounds plus 25 tentative values.

24th ANNUAL MEETING THIS MONTH. The program and registration cards for the 24th Annual Meeting were mailed on September 17, and the number of registration cards returned has been most gratifying. We hope that the broad scope of subject matter and the distinguished roster of speakers will appeal to representatives of all of our member companies. We look forward to a profitable and interesting meeting. The officers of the Foundation also have a full program, with meetings scheduled for the Executive Committee and two meetings for the Board of Trustees.

THRESHOLD LIMIT VALUES FOR 1958¹

Adopted at the Twentieth Annual Meeting of the American Conference of Governmental Industrial Hygienists, Atlantic City, April 19-22, 1958

Threshold limits should be used as guides in the control of health hazards and should not be regarded as fine lines between safe and dangerous concentrations. They represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day, without adverse effect.

These limits are intended for use in the field of industrial hygiene and should be employed by persons trained in this field. (Condensed. For further discussion see the 1957 values in October, 1957 Digest).

Recommended Values²

Gases and Vapors

Substance	PPM	Approx. Mg. per Cu. M.	Substance	PPM	Approx. Mg. per Cu. M.
Acetaldehyde	200	360	Cellosolve		
Acetic acid	10	25	(2-ethoxyethanol)	200	740
Acetic anhydride	5	20	Cellosolve acetate		
Acetone	1000	2400	(2-ethoxyethyl acetate)	100	540
Acrolein	0.5	1.2	Chlorine	1	3
Acrylonitrile	20	45	Chlorine trifluoride	0.1	0.4
Allyl alcohol	5	12	Chlorobenzene		
Allyl chloride	5	15	(monochlorobenzene)	75	350
Allyl propyl disulfide	2	12	Chloroform		
Ammonia	100	70	(trichloromethane)	100	490
Amyl acetate	200	1050	1-Chloro-1-nitropropane	20	100
Amyl alcohol			Chloropicrin	1	7
(isocamyl alcohol)	100	360	Chloroprene		
Aniline	5	19	(2-chloro-1,3butadiene)	25	90
Arsine	0.05	0.2	Cresol (all isomers)	5	22
Benzene (benzol)	25	80	Cyclohexane	400	1400
Benzyl chloride	1	5	Cyclohexanol	100	410
Bromine	1	7	Cyclohexanone	100	400
Butadiene			Cyclohexene	400	1350
(1,3-butadiene)	1000	2200	Cyclopropane	400	690
Butanone			Decaborane	0.05	0.3
(methyl ethyl ketone)	250	740	Diacetone alcohol		
Butyl acetate			(4-hydroxy-4-methyl-		
(n-butyl acetate)	200	950	2-pentanone)	50	240
Butyl alcohol			Diborane	0.1	0.1
(n-butanol)	100	300	o-Dichlorobenzene	50	300
Butylamine	5	15	Dichlorodifluoromethane	1000	4950
Butyl cellosolve			1,1-Dichloroethane	100	400
(2-butoxyethanol)	50	240	1,2-Dichloroethane		
Carbon dioxide	5000	9000	(ethylene dichloride)	100	400
Carbon disulfide	20	60	1,2-Dichloroethylene	200	790
Carbon monoxide	100	110	Dichloroethyl ether	15	90
Carbon tetrachloride	25	160	Dichloromonofluoro-		
			methane	1000	4200

1. Copied from A.M.A. Archives of Industrial Health, August, 1958.

2. Revisions have been made in the values for mesityl oxide and nitric acid.

Gases and Vapors (cont.)

Substance	PPM	Approx. Mg. per Cu. M.	Substance	PPM	Approx. per Cu.
1,1-Dichloro-1-nitro-ethane	10	60	Methyl cellosolve acetate (ethylene glycol mono-methyl ether acetate)	25	120
Dichlorotetrafluoroethane	1000	7000	Methyl chloride	100	210
Diethylamine	25	75	Methylal (dimethoxy-methane)	1000	3100
Diffuorodibromomethane	100	860	Methyl chloroform (1,1,1-trichloroethane)	500	2700
Diisobutyl ketone	50	290	Methylcyclohexane	500	2000
Dimethylaniline (N-dimethylaniline)	5	25	Methylcyclohexanol	100	470
Dimethylsulfate	1	5	Methylcyclohexanone	100	460
Dioxane (diethylene dioxide)	100	360	Methyl formate	100	250
Ethyl acetate	400	1400	Methyl isobutyl carbinol (methyl amyl alcohol)	25	100
Ethyl acrylate	25	100	Methylene chloride (dichloromethane)	500	1750
Ethyl alcohol (ethanol)	1000	1900	Naphtha (coal tar)	200	800
Ethylamine	25	45	Naphtha (petroleum)	500	2000
Ethylbenzene	200	870	Nickel carbonyl	0.001	0
Ethyl bromide	200	890	Nitric acid	10	25
Ethyl chloride	1000	2600	p-Nitroaniline	1	5
Ethyl ether	400	1200	Nitrobenzene	1	5
Ethyl formate	100	300	Nitroethane	100	310
Ethyl silicate	100	850	Nitrogen dioxide	5	9
Ethylene chlorohydrin	5	16	Nitroglycerin	0.5	5
Ethylenediamine	10	30	Nitromethane	100	250
Ethylene dibromide (1,2-dibromoethane)	25	190	2-Nitropropane	50	180
Ethylene imine	5	9	Nitrotoluene	5	30
Ethylene oxide	50	90	Octane	500	2350
Fluorine	0.1	0.2	Ozone	0.1	0.2
Fluorotrichloro-methane	1000	5600	Pentane	1000	2950
Formaldehyde	5	6	Pentanone (methyl propyl ketone)	200	700
Furfural	5	20	Perchloroethylene (tetrachloroethylene)	200	1350
Gasoline	500	2000	Phenol	5	19
Heptane (n-heptane)	500	2000	Phenylhydrazine	5	22
Hexane (n-hexane)	500	1800	Phosgene (carbonyl chloride)	1	4
Hexanone (methyl butyl ketone)	100	410	Phosphine	0.05	0.07
Hexone (methyl isobutyl ketone)	100	410	Phosphorus trichloride	0.5	3
Hydrazine	1	1.3	Propyl acetate	200	840
Hydrogen bromide	5	17	Propyl alcohol (isopropyl alcohol)	400	980
Hydrogen chloride	5	7	Propyl ether (isopropyl ether)	500	2100
Hydrogen cyanide	10	11	Propylene dichloride (1,2-dichloropropane)	75	350
Hydrogen fluoride	3	2	Propylene imine	25	60
Hydrogen peroxide, 90%	1	1.4	Pyridine	10	30
Hydrogen selenide	0.05	0.2	Quinone	0.1	0.4
Hydrogen sulfide	20	30	Stibine	0.1	0.5
Iodine	0.1	1	Stoddard solvent	500	2900
Isophorone	25	140	Styrene monomer (phenylethylene)	100	420
Isopropylamine	5	12	Sulfur dioxide	5	13
Mesityl oxide	25	100	Sulfur hexafluoride	1000	6000
Methyl acetate	200	610	Sulfur monochloride	1	6
Methyl acetylene	1000	1650	Sulfur pentafluoride	0.021	0.25
Methyl acrylate	10	35	p-Tertiarybutyltoluene	10	60
Methyl alcohol (methanol)	200	260			
Methyl bromide	20	80			
Methyl cellosolve (2-methoxyethanol)	25	80			

Gases and Vapors (cont.)

Substance	PPM	Approx. Mg. per Cu. M.	Substance	PPM
2,2-Tetrachloro-			Trifluoromonobromo-	
ethane	5	35	methane	1000
hydrofuran	200	590	Turpentine	100
nitromethane	1	8	Vinyl chloride	
(toluol)	200	750	(chloroethylene)	500
hydrazine	5	22	Xylene (xylol)	200
chloroethylene	200	1050		

Toxic Dusts, Fumes, and Mists

Substance	Mg. per Cu. M.	Substance	
(1,2,3,4,10,10-hexachloro-		Malathion (O,O-dimethyl dithio-	
4a,5,8,8a-hexahydro-1,4,5,8-		phosphate of diethyl mercapto-	
methanonaphthalene)	0.25	succinate)	15
sulfamate (ammonium sulfamate)	15	Manganese	5
mercury	0.5	Mercury	2.5
(alpha-naphthyl-thiourea)	0.3	Mercury (organic compounds)	2.5
(soluble compounds)	0.5	Methoxychlor (2,2-di-p-methoxy-	
oxide fume	0.1	phenyl-1,1,1-trichloroethane)	15
arsenate	0.1	Molybdenum	
(1,2,4,5,6,7,8,8-		(soluble compounds)	5
chloro-3a,4,7,7a-tetra-		(insoluble compounds)	15
4,7-methanoindane)	2	Nicotine	2.5
camphene, 60%	0.5	Parathion (O,O-diethyl O-p-	
diphenyl oxide	0.5	nitrophenyl thiophosphate)	2.5
diphenyl (42% chlorine)	1	Pentachloronaphthalene	2.5
diphenyl (54% chlorine)	0.5	Pentachlorophenol	2.5
acid and chromates (as CrO ₃)	0.1	Phosphorus (yellow)	2.5
herbicide (sodium 2-(2,4-		Phosphorus pentachloride	1
terophenoxy) ethanol hydrogen		Phosphorus pentasulfide	1
(as CN)	15	Picric acid	0.1
2,4-dichlorophenoxyacetic	5	Pyrethrum	2
(2,2-bis(p-chlorophenyl)-		Rotenone	5
1,1-trichloroethane)	10	Selenium compounds (as Se)	0.1
(1,2,3,4,10,10-hexachloro-		Sodium fluoroacetate (1080)	0.1
1-epoxy-1,4,4a,5,6,7,8,8a-octa-		Sodium hydroxide	2
1,4,5,8,-dimethano-naphtha-		Strychnine	0.15
	0.25	Sulfuric acid	1
benzene	1	TEDP (tetraethyl	
toluene	1.5	dithionopyrophosphate)	0.2
o-cresol	0.2	TEPP (tetraethyl pyrophosphate)	0.05
O-ethyl O-p-nitrophenyl		Tellurium	0.1
benzenephosphonate)	0.5	Tetryl (2,4,6-trinitrophenyl-	
(ferric dimethyl		methylnitramine)	1.5
carbamate)	15	Thiram (tetramethyl thiuram	
vanadium dust	1	disulfide)	5
oxide	2.5	Thallium (soluble compounds)	0.1
pyrenequinone	2	Titanium dioxide	15
oxide fume	15	Trichloronaphthalene	5
arsenate	0.2	Trinitrotoluene	1.5
(hexachlorocyclohexane,	0.15	Uranium	
isomer)	0.5	(soluble compounds)	0.05
vanadium oxide fume	15	(insoluble compounds)	0.25
		Vanadium	
		(V ₂ O ₅ dust)	0.5
		(V ₂ O ₅ fume)	0.1

Toxic Dusts, Fumes, and Mists (cont.)

Substance	Mg. per Cu. M.
Warfarin (3-(α -acetonylbenzyl)-4-hydroxycoumarin	0.5
Zinc oxide fumes	15
Zirconium compounds (as Zr)	5

Radioactivity: For permissible concentrations of radioisotopes in air, see "Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentration in Air," Handbook 52, U. S. Department of Commerce, National Bureau of Standards, March 1954. In addition, see "Permissible Dose from External Sources of Ionizing Radiation," Handbook 53, U. S. Department of Commerce, National Bureau of Standards, September 24, 1954. The work of the two publications mentioned above is in progress.

Mineral Dusts

Substance	MPPCF	Substance	MPPCF
Aluminum oxide	50	Silica	
Asbestos	5	high (above 50% free SiO_2)	
Dust (nuisance, no free silica)	50	medium (5 to 50% free SiO_2)	
Mica (below 5% free silica)	20	low (below 5% free SiO_2)	
Portland cement	50	Silicon carbide	
Talc	20	Soapstone (below 5% free SiO_2)	

Tentative Values

Substance	PPM	Approx. Mg. per Cu. M.	Substance	PPM	Approx. Mg. per Cu. M.
* Acetylene tetrabromide	1	14	* Monomethyl aniline	2	
* Allyl glycidyl ether (AGE)	10	45	* Paradichlorobenzene	75	
* Beryllium		$2\text{v}/\text{m}^3$	* Perchloromethyl mercaptan	0.1	
* Boron trifluoride	1	3	* Phenyl glycidyl ether (PGE)	50	
* n-Butyl glycidyl ether (BGE)	50	270	* Phosphoric acid		
* Butyl mercaptan	10	35	* n-Propyl nitrate	25	
* Chlorine dioxide	0.1	0.3	* Propylene oxide	100	
* Chloroacetaldehyde	1	3	* Tertiary butyl alcohol	100	
* Chlorobromomethane (ClBrCH_3)	400	2100	* Toluene-2,4-diisocyanate	0.1	
* Diglycidyl ether (DGE)	10	55	* 1,2,3-Trichloropropane	50	
* Dimethyl formamide	20	60	* Triethyl amine	25	
* 1,1-Dimethyl hydrazine	0.5	1	* Triorthocresyl phosphate		
* Dipropylene glycol dimethylether	100	600	* Vinyl toluene	100	
* Ethyl mercaptan	250	640	* Yttrium and inorganic compounds		
* Furfuryl alcohol	50	200	* Xylidine	5	
* Glycidol	50	150	* Teflon decomposition products	**	
* sec-Hexyl acetate	100	590	* Pentaborane (B_5H_9)	**	
* Isopropyl glycidyl ether (IGE)	50	240			
* Lithium hydride		$25\text{v}/\text{m}^3$			
* Methyl mercaptan	50	100			
* α -Methyl styrene	100	480			

* These values appeared on the tentative list for 1957.

** Until more data are forthcoming, it is important that atmospheric concentrations of these materials to which workers are exposed must be kept as near 0 as possible.

(Signed): William L. Ball, W. Clark Cooper, H. E. Stokinger, Keith H. Jacobson, Hervey B. Elkins, W. H. Reinhart, and Allan L. Coleman, Chairman.