

PLAINTIFF'S EXHIBIT

IHF-443

# INDUSTRIAL HYGIENE FOUNDATION

# 1967 Annual Report

INDUSTRIAL HYGIENE FOUNDATION OF AMERICA

4400 FIFTH AVENUE PITTSBURGH, PA

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ESTABLISHED 1935

(412) 621-1100

INDUSTRIAL HYGIENE FOUNDATION OF AMERICA, INC.

4400 FIFTH AVENUE PITTSBURGH, PA. 15213

TO THE MEMBERSHIP OF IHF:

Almost every paper at the 32nd Annual Meeting of the Industrial Hygiene Foundation, October 10-11, 1967, related in some manner to the importance of our efforts to further progress in health conservation management. Industry's role in furthering progress in environmental and occupational health programs through IHF has been important in the past but will be vital to future progress, which will depend increasingly upon enlightened management of our nation's resources. Thus, IHF's efforts merit genuine support of all those interested in health conservation, whether in industry, government, labor or academic institutions.

The Foundation's Board of Trustees enthusiastically support the programs which the Managing Director, Dr. Robert T. P. deTreville, and his staff and advisors are developing. A review of these programs is given in the 1967 Annual Report in an effort to keep the Membership informed and to interest prospective members in the work of the Foundation. We welcome your comments and would be pleased to supply additional information upon request.

Sincerely,

E. K. Davison

E. K. Davison
Chairman, Board of Trustees

EKD:sjc

## FOUNDATION FACTS

Robert T. P. deTreville, M.D.
Managing Director

The 1966-67 Information Booklet on Membership in the Industrial Hygiene Foundation (IHF) is designed to help answer the questions: "What is IHF, and why should you be interested?" It describes our mission, lists types of membership and current members, and also provides a schedule of dues with an application form on the rear cover. Many of the benefits of membership are listed, including technical meetings and publications, and examples of the Foundation's laboratory, field and information research and activities of its Chemical-Toxicological, Engineering, Legal, Medical, and Nursing Committees. Administration of the Foundation's affairs is mentioned, along with the current membership of the Board of Trustees and technical committees. A panel of expert advisors who have agreed to assist in specific areas of IHF research is also shown. The Foundation's programs and plans have also been outlined in numerous meetings and publications since 1963 which are described in the 1967 Publications List.

There can be no doubt that the Foundation's staff and its membership are working effectively together in an ever increasing number of areas of importance to health conservation which can be best undertaken by IHF as industry's nonprofit research association. Short and long-term investigative programs being conducted in the Foundation's Research Laboratory and in the field also promise to benefit industry's workforce, and ultimately the public at large. These will be described later in this Annual Report on page 4.

At a meeting of the Board of Trustees October 9, 1967, steps were taken to help further development of a pulmonary research center in the University of Pittsburgh with IHF's experimental pulmonary pathology laboratory serving as a nucleus around which to build such a capability. Satisfactory arrangements were made in this regard, effective January 1, 1968, for the establishment of the Industrial Hygiene Research Unit (formerly called IHF Research Laboratory) within the University of Pittsburgh, Graduate School of Public Health, Department of Occupational Health.

Activities of IHF technical committees were summarized in the reports of their chairmen at the Annual Membership Meeting, which are included in the Minutes on page 18.

Environmental and occupational health studies performed in the field for several member companies during the year ranged from interpretation of blood and urine tests for possible lead exposure to comprehensive industrial hygiene engineering surveys of specific plant operations.

Steps towards initiation of an epidemiological study of employees in one plant of a member company exposed to dusts were taken in the last half of 1967.

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Data extracted from this statistical research should be useful to the American Conference of Governmental Industrial Hygienists' Threshold Limits Committee, as part of the Foundation's central data repository project.

IHF's mental health project (Employee Mental Health and Industrial Nursing Practices) under subcontract to the American Institutes for Research (AIR) made signficant progress during this second year of the five-year National Institute of Mental Health training grant awarded to the Foundation in July 1966. Mr. Harris H. Shettel, Director of AIR's Instructional Development Program, who is directing IHF's project, reported at the Foundation's 32nd Annual Meeting on the success of securing professional staff: Enid Goldberg, R. N., a psychiatric nurse, and Iva Pleasants, R. N., an industrial nurse, plus additional research assistants. Their first major task was to find out what nurses are doing at present in the area of employee mental health, the support which could be expected from their immediate environment (especially from medical personnel), how they would react to the notion of taking on increased responsibility in this area, and what kind of course content would be most useful to them. To secure this information, a case study record form and a comprehensive questionnaire were developed and distributed to nurses in several IHF member companies. The analysis of the data will lead to the initial determination of the role of the industrial nurse with regard to employee mental health and also determine course content for future programmed instruction in this area. (Mr. Shettel's paper, "Mental Health and the Industrial Nurse," will be published in the 32nd Annual Meeting Transactions, available April 1968.)

The Industrial Hygiene Digest, now in its 32nd year, continues to be the principal publication of IHF. Dr. John Metschl, Editor, excerpts articles from a wide range of literature on environmental and occupational health for the monthly issues. This medium has produced a file of over 30,000 abstracts providing a ready source of information on inplant dust, air pollution, noise, heat, solvents, dermatitis, toxicity of materials, ionizing radiation and up-to-date information on new products and procedures. Plans are underway to augment this facility and expand this information service to our members.

From all of the above it can readily be seen that IHF is setting out to perform its mission in a manner consistent with present and expected needs of an increasingly technological society. It is contributing in a unique way to human progress by introducing scientific concepts of management, based on genuine needs and factual data. IHF's membership deserves great credit for encouraging our efforts, and we hope we can count on a greatly expanded expression of interest and support on a broader base in industry as our programs mature.

# RESEARCH LABORATORY

Paul Gross, M. D.
Director of Research Laboratory

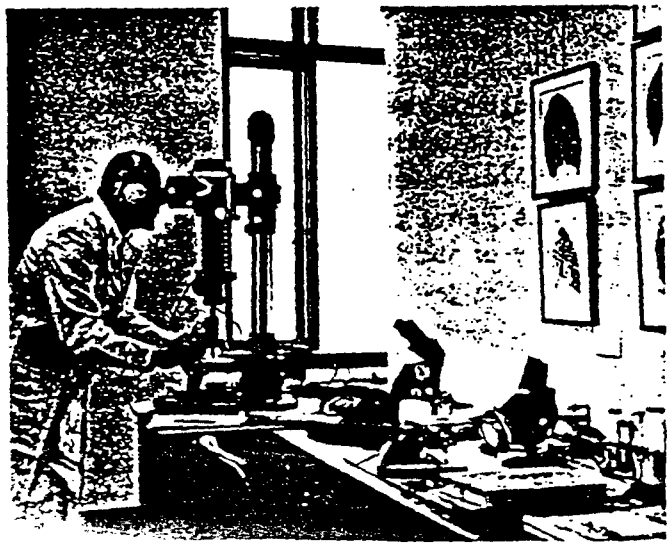
The Industrial Hygiene Foundation's current experimental research programs are described in the following report of progress.

Emphysema Study. A study, begun two years ago and based on preliminary research sponsored by the American Iron and Steel Institute, is concerned with the pulmonary effects of sulfur dioxide and nitrogen dioxide adsorbed on activated carbon and inhaled by small laboratory animals. Other series of these small animals, consisting of guinea pigs, rats and hamsters with one half of these with normal lungs and the other half with emphysematous lungs, inhaled high concentrations of industrial dusts. The evaluation of the pulmonary changes produced is in progress.

The paucity or absence of dust in regions of emphysema was perhaps the most outstanding finding in this study and was caused by accelerated clearance of dust in regions of emphysema. There are two apparent reasons for the improved clearance: (1) in the absence of alveolar septa, dust cannot be sequestrated, and (2) the removal of evaginating alveoli by emphysema removes obstacles in, and shortens the pathway of, the proximally moving dust.

The impression was gained from a study of the sections that the lungs of papain-treated animals contained less dust than their corresponding non-papain-treated controls. Whether or not this is fact must await gravimetric determinations of the dust in the lungs. An extension of this study is contemplated for the immediate future.

(Sponsors: American Iron and Steel Institute, American Petroleum Institute, Automobile Manufacturers Association, Inc., Bituminous Coal Research, Inc., and Manufacturing Chemists Association.)



Asbestos Bioeffects. An investigation has recently been concluded dealing with long-term effects on the lungs of animals inhaling chrysotile asbestos dust. Of the three species of animals employed, guinea pigs, hamsters and rats, only the latter develop lung cancer. An overall prevalence of 30% of malignant lung tumors has been noted. Of some interest was the finding that animals in which lung clearance had been impaired had double the lung cancer rate (48%) of animals without this impairment (24%). (Sponsor: U. S. Public Health Service.)

Fibrous Dust Study. A continuation of the four-phase investigation dealing with the pulmonary effects of fibrous dusts has resulted in the completion of two manuscripts: "'Asbestos' Bodies: Their Nonspecificity" by Gross, P., Cralley, L. J. and deTreville, R. T. P. —to be published in the Journal of the American Medical Association and "Pulmonary Ferruginous Bodies: 1. Their Development in Response to Filamentous Dusts. 2. A Method of Isolating and Concentrating Them." by Gross, P., deTreville, R. T. P., Cralley, L. J. and Davis, J. M. G. —to be published in the AMA Archives of Pathology. Both are concerned with Phase I, the development of ferruginous bodies. These structures have been demonstrated to be nonspecific formations that result as a response to the presence of filamentous, insoluble dust particles in the air spaces of the lung.

Additional work on Phase II, dealing with the nature of the carcinogenic component of chrysotile, has involved the use of synthetic chrysotile produced not only by Dr. William T. Granquist, Senior Fellow of Mellon Institute, but also by the Johns-Manville Research and Engineering Center (Dr. F. L. Pundesack. Many series of animals have been injected intratracheally and intrapleurally with synthetic chrysotile to which one or the other of the following metals had been adsorbed: nickel, chromium, manganese, and cobalt. These animals will be studied for the long-term pathologic effects of the injected materials upon the lungs and pleural membranes, particularly the development of tumors.

A comparative study, Phase III, of the pathogenic components of the three main types of asbestos dust (chrysotile, amosite, and crocidolite) has been initiated. This investigation involves an attempt to divorce associated trace metals and possible hydrocarbons from each of the three types of asbestos and to study the long-term effects of such treated asbestos dusts.

Phase IV of this investigation has been concerned with electron microscopic studies of ferruginous bodies from human lungs as well as from the lungs of hamsters. This work (in cooperation with Dr. Robert V. Rice, Senior Fellow, Mr. Martin N. Haller, Fellow, and Miss Alida C. Swanson, Assistant in Bio-Chemistry, all of Mellon Institute, and Dr. John M. G. Davis of Cambridge, United Kingdom) is being accomplished by Drs. Robert T. P. deTreville, IHF Managing Director, and H. Michael Utidjian, IHF Fellow in Occupational Medicine. The ultimate aim of this study is to identify the central fiber of the ferruginous bodies that have been found in nearly all (97%) of lungs of 100 unselected hospital autopsies in Pittsburgh, examined by a technique developed in the Foundation's Laboratory, and refined by Dr. Utidjian. Utilizing electron diffraction and electron-probe analysis (in cooperation with Dr. Lawrence F. Vassamillet, Senior Fellow of Mellon Institute) ferruginous bodies isolated and concentrated by a newly devised method will be studied by Mr. Haller in order to identify the central core.

(Sponsors: National Institutes of Health, U. S. Public Health Service Division of Occupational Health, Johns-Manville Corporation, Owens-Corning Fiberglas Corporation, PPG Industries, and Pittsburgh Corning Corporation.)

Lung Clearance Study. Nearing completion is a study of the clearance mechanism of the lung. This study is based upon the enumeration of scavenger cells that respond to the inhalation or the intratracheal injection of a number of different dusts. The enumeration of cells is performed on saline washings injected and removed from the tracheo-bronchial tree at different time periods after the imposition of the dust burden on the lungs.

(Sponsor: U. S. Public Health Service.)

Mechanism of Action of Silica. A study (in collaboration with Dr. Heinrich Brieger, Professor Emeritus, Jefferson Medical College) dealing with the theory of silicosis has been completed and has recently been published: "On the Theory of Silicosis III. Stishovite" by Brieger, H. and Gross, P., Archives of Environmental Health 15:751-757, December 1967. It is the fourth and final paper. Specifically, these papers have dealt with the comparative pathogenicity of the different crystalline forms of silica. This study indicates that a crystalline form of $SiO_2$, Stishovite, is biologically inert and that this biologic inertness is related to an atomic arrangement in octahedrons whereas the atoms in the biologically active forms of crystalline silica are arranged in tetrahedrons.

Experimental Oncology. Data are being collected and evaluated from rats and hamsters, the lungs of which had been exposed to x-rays. The purpose of this study is to determine if such x-ray exposure may be useful in the development of an experimental model for determining the potential of suspected materials to produce lung cancer.

(Sponsor: U. S. Public Health Service.)

Aluminum Dust Study. An investigation has been initiated to determine the relative pathogenicity of United States produced metallic aluminum powder compared to that of the British "Pyro"-type of aluminum powder. The latter is reported to have produced fibrosis of the lung in animals and to have caused severe pulmonary fibrosis in workers engaged in production of the powder and exposed to high levels of the dust over long periods of time. This experience is in apparent contrast to that in the United States and it is hoped that laboratory experiments, supplemented by clinical and epidemiological studies of United States workers will help identify the cause of the hazard and allow its elimination.

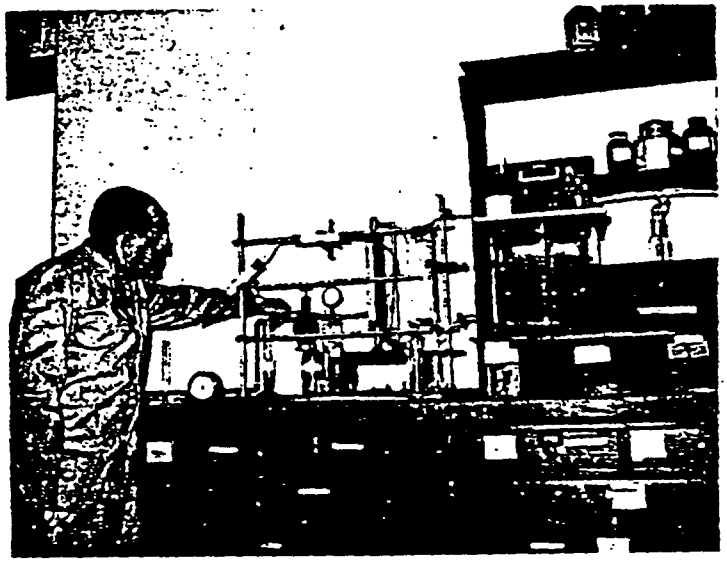
(Sponsors: Aluminum Company of America, Reynolds Metals Company, Silberline Manufacturing Company, Inc., U. S. Bronze Powders, Inc., and Valley Metallurgical Processing Company, Inc.)

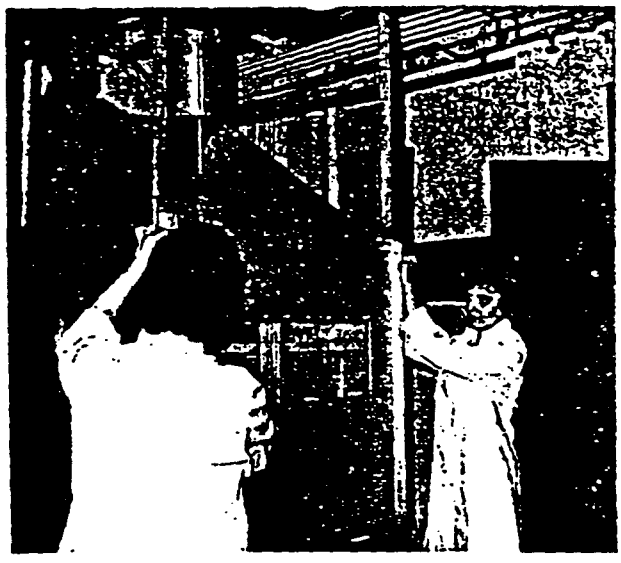
Fibrous Glass Study. Independent of the four-phased Fibrous Dust Studies an investigation is underway to determine the long-term pulmonary effects when filamentous glass dusts, coated as well as uncoated, are inhaled. Three species of animals (guinea pigs, rats and hamsters) are being exposed to high concentrations of these dusts in inhalation chambers. Another part of this study is in progress to determine whether or not filamentous glass dust will deleteriously affec a pre-existing emphysema and whether or not the deposition of this dust in the lu will predispose to papain-induced emphysema.

(Sponsor: Owens-Corning Fiberglas Corporation.)

Range-Finding Toxicity Studies. Range-finding toxicity studies on compounds used in industry are conducted in the Foundation's laboratory, upon request, under Dr. Gross with the assistance of Marianne Kaschak, Research Associate. Chemical-Toxicological Series Bulletin No. 6, "Range-Finding Toxicity Data for 43 Compounds," was published in 1967 describing the results in tabular form of these compounds tested over a number of years for several member companies.

Full-time laboratory staff assisting Dr. Gross in the above studies are: Mary Ann Babyak, Margaret H. Cooper, Guy E. Dent, Marianne Kaschak, Dawn McGuire, Leon Miller, Ethel B. Tolker and Dr. H. Michael D. Utidjian.





Operating apparatus for concentrated vapor exposure for acute inhalation toxicity studies is Guy E. Dent (above).

Mary Ann Babyak, Guy E. Dent, and Marianne Kaschak using team effort to adjust a Wright Dust Feed Mechanism used for long-term inhalation exposure studies (upper right).

Ethel B. Tolker examines slide for alveolar clearance cell counts, assisted by Marianne Kaschak (opposite).



1967

## FINANCIAL SUMMARY OF IHF OPERATIONS

| | | | |
|---|---|---|---|
| I. | Income: | A. General & Administrative | |
| | | 1. Membership Dues | $ 94,300 |
| | | 2. Digest Subscriptions & Publications | 7,800 |
| | | 3. Discussionals and Seminars | 3,500 |
| | | 4. Nurses Continuing Education (NIMH) | 107,400 |
| | | 5. Annual Meeting | 3,600 |
| | | 6. Engineering Surveys | 21,600 |
| | | 7. Interest | 1,600 |
| | | Sub-Total | $ 239,800 |
| | | B. Laboratories | |
| | | 1. Fibrous Dust | 60,000 |
| | | 2. Emphysema | 49,000 |
| | | 3. Epidemiology | 15,000 |
| | | 4. Filamentous Glass | 30,000 |
| | | 5. Aluminum Dust | 31,500 |
| | | 6. Short-term studies | 10,300 |
| | | Sub-Total | 195,800 |
| | | TOTAL*. . . . . | 435,60( |
| II. | Expenditures: | | |
| | | A. Mellon Institute Contract | $ 185,80 |
| | | B. American Institutes for Research | 84,40 |
| | | C. Other | 4( |
| | | TOTAL*. . . . . | $ 270.6( |
| III. | EXCESS OF INCOME OVER EXPENDITURES* | | $ 165,0 |

* Income includes payments received in stated year for laboratory work and administrative expenses in succeeding year.

## CURRENT PUBLICATIONS

Industrial Hygiene Digest (monthly)
Industrial Hygiene Digest Annual Index
Industrial Hygiene Digest Second Decennial Index 1955-1964
32nd Annual Meeting Transactions (1967)
Engineering Committee Information Exchange Capsule
Publications List

### Bulletins

Chemical-Toxicological Series
- No. 6 - Range-Finding Toxicity Data for 43 Compounds
- No. 7 - Threshold Limit Values: A report of progress in 1967 and Announcement of 1968 Workshop on Threshold Limit Values

Engineering Series
- No. 7 - Combustible Gas and Vapor Detectors

Legal Series
- No. 7 - Rehabilitation

Medical Series
- No.10 - Emphysema in Industry
- No.11 - Asbestos Bioeffects Research for Industry
- No.12 - The Pneumoconioses

Nursing Series
- No. 1 - Employee Mental Health and Industrial Nursing Practices: An Experimental Course

### Reprints

Asbestos Bodies: Their Nonspecificity
Experimental Asbestosis: The Development of Lung Cancer in Rats with Pulmonary Deposits of Chrysotile Asbestos Dust
Experimental Silicosis: The "Atypical" Reaction in the Syrian Hamster
Lignite and the Derived Steam-Activated Carbon
The Mechanisms of Some Structural Alterations of the Lung Caused by Environmental Stresses
The Pulmonary Reactions to Toxic Gases
Radiation Pneumonitis: X-Ray Induced Lesions in Hamsters and Rats (co-authored by IHF Staff Member)

## OFFICERS AND MEMBERS OF THE BOARD OF TRUSTEES

Chairman: E. K. DAVISON
Vice Chairman: ANDREW KALMYKOW
Secretary: Dr. H. H. SCHRENK (Trustee Emeritus)
Treasurer: Dr. THEODORE F. HATCH (Trustee Emeritus)
Managing Director: Dr. R.T.P. deTREVILLE

EARLE T. ANDREWS
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J. S. HARRISON
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General Motors Corporation

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Mine Safety Appliances Company

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U.S. Steel Corporation

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American Can Company

Dr. RALPH F. SCHNEIDER
Standard Oil Company (N.J.)

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LEO TEPLOW
American Iron & Steel Institute

Dr. JOSEPH F. TREON
Atlas Chemical Industries, Inc.

JOHN VYVERBERG
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Dr. G. ARTHUR WEBB
Mellon Institute of Carnegie-Mellon Univ.

EDWARD R. WEIDLEIN, JR.
Union Carbide Corporation

Dr. JOHN A. ZAPP, JR.
E. I. du Pont de Nemours & Co., Inc.

## TRUSTEE EMERITUS

Dr. Philip Drinker
Fitzwilliam, New Hampshire

Theodore C. Waters
Baltimore, Maryland

Shown on the opposite page is a photograph of the pictorial display honoring new IHF Trustees Emeriti which was exhibited at the 32nd Annual Meeting.

# TRUSTEES EMERITI . . .

## *in Appreciation*

## INDUSTRIAL HYGIENE FOUNDATION OF AMERICA

## 32nd ANNUAL MEETING - OCT. 10, & 11, 1967



Mr. Andrew Fletcher

Began career as a shipyard mechanic after graduation from Yale University in 1916. One of the true founders of Industrial Hygiene Foundation...has personally charted its course since 1937, two years after the Foundation was organized. Has served as Board Chairman, Vice Chairman, and Treasurer during his 30 years of Industrial Hygiene Foundation's Board... the Foundation has been fortunate to have had the devoted attention of this outstanding industrialist. Became honorary Chairman of the Board of St. Joseph Lead Company on May 8, 1967...has held many offices in his 46 years with that company. He and Mrs. Fletcher are taking a 49th Wedding Anniversary trip to Expo '67 ...thus, we cannot have him here for the 32nd Annual Meeting to personally honor him.



Dr. Theodore F. Hatch

Began interest in industrial hygiene at Harvard University where from 1926-1936 he assisted in organizing and developing a new Department of Industrial Hygiene. Was Research Director, Industrial Hygiene Foundation (1945-1949). As Professor of Industrial Health Engineering, Graduate School of Public Health, University of Pittsburgh, he assisted in organizing the new Graduate School of Public Health and Department of Occupational Health. Served as World Health Organization advisor in panel of health experts on environmental health...has won numerous awards...received University of Maine Honorary Doctor of Science degree, June 1966, for contributions in the environmental health sciences. His service as Trustee and Officer (Treasurer) has been of great value to the Foundation, and we look forward to receiving his continued assistance and guidance in his role as Advisory Fellow and Trustee Emeritus.



Dr. Kenneth W. Smith

Pioneered in identifying and quantitating harmful effects of asbestos dust on lungs of asbestos miners. Contributed greatly to the advancement of industrial hygiene in the asbestos industry as Johns-Manville Corporation's Medical Director. Assisted IHF Laboratory's development of plans for experimental research in fibrous dust bioeffects and in the design and implementation of IHF meetings and publication on the pneumoconioses. Served as member of Foundation's Medical Committee 1955-1959...as Trustee since 1958...Vice Chairman from 1959 to 1962. Dr. Smith has recently been appointed Medical Director of The Brush Beryllium Company and will continue to assist IHF in advisory status.



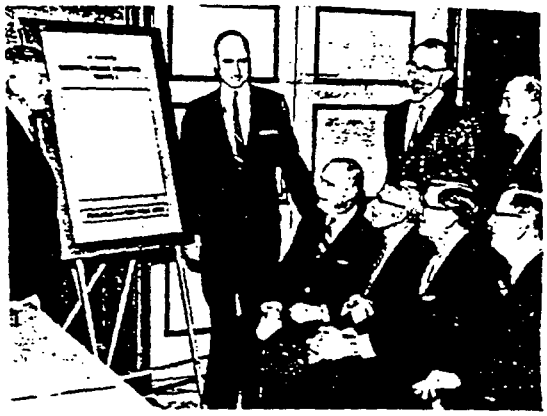
Dr. H. H. Schrenk

Well known for his outstanding research in the U.S. Bureau of Mines in association with the late Drs. Royd R. Sayers and William P. Yant, Foundation Trustees. Dr. Schrenk joined IHF in 1949 as Research Director ...has served as Research Director (1949-1958). IHF Managing Director (1958-1963). IHF Trustee (1958-1967) and Secretary of Board of Trustees since 1964. Member of the IHF Chemical-Toxicological Committee. Member of the Pennsylvania Air Pollution Commission ...Research Consultant to President of Mine Safety Appliances Company. Dr. Schrenk has contributed greatly to the success of IHF during the past 18 years and, although retired, continues to provide valuable guidance in planning the Foundation's activities.

# TECHNICAL COMMUNICATION — 32nd Annual Meeting



The subject of speaker John M. G. Davis of the Department of Pathology, University of Cambridge, England, was "Asbestos Bodies and Bioeffects—A Detective Story."



Plans for the June 1968 IHF publication INDUSTRIAL HYGIENE HIGHLIGHTS are discussed by Editor Lester V. Cralley of Alcoa and Dr. Robert T. P. deTreville, IHF Managing Director (standing on either side of the publicity exhibit) with several of the authors of the book: Thomas B. Bonney, Lewis J. Cralley, George D. Clayton, Robert G. Keenan (seated left to right) and Ray C. Wanta and Theodore Hatch (standing left to right). Messrs. Cralley, USPHS, and Clayton, AIHA, are also Co-Editors.



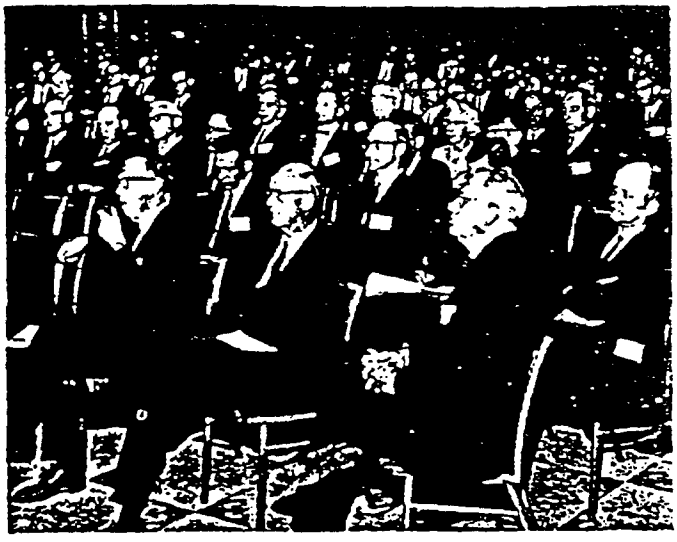
Viewing the IHF publications exhibit were speakers F. J. Solon, Jr., Johns-Manville Corporation, and Carl G. Staelin, Owens-Corning Fiberglas Corporation. (left to right)



Conferring on environmental and occupational health research are (left to right) Dr. E. P. Radford, Jr., Director of the Department of Environmental Health, University of Cincinnati; Theodore Hetzler, Jr., member of the IHF Legal Committee; and Allen Kent, Director, University of Pittsburgh Knowledge Availability Systems Center.



Remarks on laser and noise bioeffects were exchanged following talks given on these subjects. Left to right in the foreground are laser speaker William T. Ham, Jr., Medical College of Virginia; Anna M. Baetjer, IHF Trustee; Lester V. Cralley, IHF Engineering Committee Chairman; noise speaker Paul L. Michael, Pennsylvania State Univ.; and Chairman of the Board E. K. Davison.



Composite representation of Management Conference audience.

The paper by F. J. Solon, Jr. on effective reporting of industrial progress in environmental health and conservation commanded the attention of George Thomas, Pittsburgh Press medical and science writer.



Voice of America correspondent, Meredith Young, interviewed Dr. Robert T. P. deTreville, IHF Managing Director, between sessions at the meeting. The broadcast was prepared for the World-Wide English Department of the Voice of America.





Management Conference speaker Dr. Richard A. Prindle, HEW Assistant Surgeon General, (far right) was interviewed by George McManus of Iron Age and Henry Pierce, Pittsburgh Post-Gazette medical and science writer (left to right). Reflecting upon Dr. Prindle's comments was Dr. Charles E. Billings of GCA Corporation.

## NEW MEMBERS on BOARD OF TRUSTEES

Elected 1967 Meeting of Members



PAUL D. COLOMBO
Manager, Employe Programs ~~Department~~
Ford Motor Company
Dearborn, Michigan



JOHN R. ENGLEHORN
Vice President
St. Joseph Lead Company
New York, New York



EUGENE W. MERRY
President
Mine Safety Appliances Co.
Pittsburgh, Pennsylvania



JOHN VYVERBERG
Director, Industry Relations
Owens-Corning Fiberglas Corporation
New York, New York



EDWARD R. WEIDLEIN, JR.
Director-Administration
Union Carbide Corporation Technical Cer
Tarrytown, New York

INDUSTRIAL HYGIENE FOUNDATION OF AMERICA, INC.

MINUTES

MEETING OF MEMBERS

Pittsburgh, Pennsylvania
October 10, 1967

The Annual Meeting of the Members of the Industrial Hygiene Foundation of America, Inc., was held at Chatham Center, Pittsburgh, Pennsylvania on Tuesday, October 10, 1967, at 3:30 pm pursuant to notice. Mr. E. K. Davison, Chairman of the Board of Trustees, presided.

Dr. H. H. Schrenk, who had been previously appointed by the Chairman to examine the proxies, reported that there were 148 companies represented by proxies that were in proper form and fully executed. 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.

A motion was made by Mr. Frederick H. Deeg and seconded by Dr. Joseph F. Treon to dispense with the reading of the minutes of the October 18, 1966, meeting. The Chairman stated that the Minute Book was available and open at the meeting for inspection by members.

The Chairman next gave a brief resume of the financial status of the Foundation, reporting that conditions are much improved and look even more promising for 1968. Mr. Davison called upon Mr. L. Harold Larsen, who has been appointed Assistant Treasurer of the Foundation, to present the forecast. Mr. Larsen's report is on file in the Minute Book.

Mr. Davison asked Dr. Robert T. P. deTreville to give the Managing Director's report.

## Report of the Managing Director

Under the title, "Foundation Facts," progress in every major area of Industrial Hygiene Foundation activity since my joining the Foundation's staff almost five years ago is reported. In reviewing presentations given at this Annual Meeting, attention is directed to the frequency with which speakers refer to Industrial Hygiene Foundation programs now under way or planned. The past

five years have been used in program planning, in a wide variety of areas of importance to the Foundation's members. By means of numerous meetings and publications, rapport and communications have been established with all those within and out of the Foundation's membership, whose cooperation and support are needed.

Administratively, the Foundation has weathered two storms, both of which, at times, threatened its existence: the first of these was financial — i.e., the need to balance the budget by means of increased income from both dues and projects. The second, which was organizational, arose out of the announced plan of Mellon Institute to merge with the Carnegie Institute of Technology to form Carnegie-Mellon University. The chief threat involved continued availability of the Foundation's Laboratory facilities in the Old Mellon Building on the University of Pittsburgh campus. As a result of the outstanding efforts of Foundation Trustee, Dr. G. A. Webb, who is Associate Director of Mellon Institute, and our Chairman, Mr. E. K. Davison, plans have been made which insure continued availability of the Foundation's present Laboratory facilities until other appropriate space, acceptable to the Foundation's research staff, can be developed. This has been accomplished by means of an Agreement between Industrial Hygiene Foundation and the University of Pittsburgh, under which the Foundation's Research Laboratory Staff becomes part of the University of Pittsburgh, Graduate School of Public Health, Department of Occupational Health. The Foundation's Board of Trustees approved the Agreement at their meeting yesterday, and it becomes effective January 1, 1968. The Foundation's Headquarters, which will remain at Mellon Institute for the present, will administer contracts with Mellon Institute, University of Pittsburgh, American Institutes for Research, and other agencies actively assisting in carrying out Industrial Hygiene Foundation programs of research and education. It is possible that later on we will need to create a small Industrial Hygiene Foundation office elsewhere to remove activities which are purely "business" in nature, such as collection of dues, for example, from the Carnegie-Mellon University setting. While such a change may become advisable eventually, it is not necessary at this time, and we are attempting to explore every avenue of cooperative endeavor which may benefit Industrial Hygiene Foundation and Carnegie-Mellon University alike.

I should now like to look at least five years into the future with you. Having leaned heavily on the Mellon Institute as a "Rock of Gibraltar" for its initial 32 years of life, Industrial Hygiene Foundation needs, and is establishing, an independent identity. Its programs are already demonstrating need for additional and improved research facilities, such as will be required in a few years to house the Industrial Hygiene Research Unit in the University of Pittsburgh, Graduate School of Public Health, Department of Occupational Health. The budge for 1968 does not include provision for such facilities but does allow for much needed minor improvements in the present Laboratory facilities. It also include

sufficient funds from project research to allow Industrial Hygiene Foundation to add several senior level, full-time staff members, which will provide much needed depth of coverage in key areas. These individuals have been identified and steps are now under way to attract them. In the face of growing Industrial HygieneFoundation programs, in order to help insure project completion and to avoid undue dependence on individuals at or near retirement age, such additions are considered minimal and are mandatory.

Even with these and the evidence of a budget balanced well "in the black" for the second consecutive year and with every evidence of rapidly growing project support, we are faced with a potentially serious and harmful "credibility gap," i.e., if Industrial Hygiene Foundation is industry's organization and if industry does consider its role of leadership in programs of Environmental and Occupational Health important, how can it allow the Foundation to depend so largely upon project support alone, with an annual "endowment" of less than $100,000 per year? I have been asked this question by representatives of the U. S. Public Health Service, the U. S. Department of Labor, universities and private institutions, and, even more embarrassingly, the Foundation's staff asks itself the same question. I have given much thought to the need for an endowment sufficient to allow the Foundation to continue its work for another 30+ years' period but have had difficulty arriving at a defensible figure which would be considered adequate. For example, I took the $300 million a year figure, which the Frye Report stated industry is presently spending for its internal health programs, and came up with the estimate of $10 billion as a minimum which industry will have spent by the year 2000—with no way of knowing whether the expenditure was effective for the purpose intended. A 1% cost for research and management would amount to $100 million or $3+ million per year for 30 years. This would be a much larger sum than Industrial Hygiene Foundation's present endowment of less than $100,000 per year, but in view of the magnitude of the nation's illness problem and of annual costs for group health insurance, sick absence and environmental health hazard control (which may well exceed 10% of a trillion dollar Gross National Product by 1975), the above suggested amount would not of itself be adequately convincing of industry's interest. For this reason, and in view of the extensive demands on the time of the Foundation's staff and Board of the fund raising activities required to develop a broad support base, I have decided against recommending creation of such an endowment at this time. The possibility of using professional fund raising assistance was suggested but is considered to be unduly expensive and also perhaps inappropriate for Industrial Hygiene Foundation. Instead, the Foundation's Board plans to embark on a program to increase annual income by broadening the base of the Foundation's support in industry. There is no reason why the majority of companies in American Industry, who believe in the importance of the Foundation's mission, should not lend their support to that of the loyal few who are now providing leadership for industry in this area. Regardless of the amount of increased income which the membership drive produces, the doubling or tripling of the Foundation's membership over a short period of time will graphically portray industry's genuine concern and effectively remove the one major barrier to Industrial Hygiene Foundation's progress which remains.

At its meeting immediately following this assembly, the newly elected Board of Trustees will elect officers. It plans an extensive reorganization in 1968 in support of the Foundation's continued growth. The Board will count on the assistance of the membership in implementing its programs, and, as always, the Foundation's staff will continue to help in any way possible.

In conclusion, let me say how gratifying it has been, especially during the past year, to see the genuine enthusiasm for Industrial Hygiene Foundation Programs and Plans spread from the faithful few to many individuals. There is every reason to believe such interest will grow even more rapidly in 1968, as our programs mature. The resulting improvement in Industrial Hygiene Foundation's image should reflect considerable credit not only on individuals concerned, but on industry, science, government, and on our system of free enterprise in general.

The Chairman next called for reports of the standing committees.

## Committee Reports

### Chemical-Toxicological

Dr. Joseph F. Treon, Chairman, reported that progress is being made in strengthening the Foundation's relations with the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limits Committee. In addition to the very successful 1967 Chemical-Toxicological Threshold Limit Values Workshop held in January, Dr. deTreville had also arranged an exploratory meeting with several members of the Threshold Limits Committee and representatives of the IHF membership on two threshold limit values of concern to companies within the Foundation's membership who manufacture explosives. The satisfactory outcome of these meetings demonstrates an important IHF role as a site of objective scientific review of existing or proposed standards. (In this regard, Dr. James H. Sterner, Moderator of this Annual Meeting's Management Conference, pointed to the success of the National Council on Radiation Protection as indicative of what is becoming an increasingly important national need in support of the nation's use of chemicals. The Linton Report calls for licensing of chemicals prior to their introduction on the market after 1970 and there must be an objective point of review and decision on health and safety matters.)

Plans are now being considered for a third Chemical-Toxicological TLV Workshop in 1968. A questionnaire is to be mailed requesting information from members of the Foundation on specific chemicals of interest to the ACGIH Threshold Limits Committee, the American Industrial Hygiene Association Hygienic Guides Committee and the Commonwealth of Pennsylvania, Department of Occupational Health. This questionnaire provides another step towards development

of the proposed IHF Central Data Repository to which Dr. Emil Pfitzer referred in his 31st Annual Meeting talk and about which Professor Allen Kent and Dr. E. P. Radford, Jr. will have something more to say in the Scientific Conference Chemical-Toxicological Session of the 32nd Annual Meeting.

Officers of the Chemical-Toxicological Committee include: Dr. Joseph F. Treon, Atlas Chemical Industries, Inc., Chairman; Dr. John A. Zapp, Jr., E. I. du Pont de Nemours and Company, Co-Chairman; and Dr. Emil A. Pfitzer, Kettering Laboratory, University of Cincinnati, Secretary. Other members of the Committee are:

Anna M. Baetjer
The Johns Hopkins University
C. P. Carpenter
Union Carbide Fellowship
Mellon Institute
H. H. Fawcett
National Academy of Sciences
H. R. Hoyle
The Dow Chemical Company
J. C. Radcliffe
Ford Motor Company
William E. Rinehart
Ethyl Corporation
Elgin D. Sallee
American Can Company
H. H. Schrenk
Pittsburgh, Pennsylvania
Herbert E. Stokinger
U. S. Public Health Service

## Engineering

The Chairman of the Committee, Dr. Lester V. Cralley, Aluminum Company of America, reported that the Third Engineering Discussional, chaired by Mr. Samuel H. Thomas of Owens-Corning Fiberglas, held in January 1967, was a great success and that the program for the Fourth Engineering Discussional prepared by Mr. N. V. Hendricks, Assistant Director for Environmental Sciences, Standard Oil Company (N.J.), is being distributed at the Annual Meeting.

Engineering Series Bulletin No. 7, "Combustible Gas and Vapor Detectors," was published in 1967 and three other bulletins are in preparation: on waste disposal, oxygen deficiency, and enclosed space ventilation.

The Committee's Information Exchange Capsule has been well received but needs "beefing-up." It is being assigned to an Engineering Committee member and it is hoped that it can be published more frequently, perhaps quarterly next year.

Industrial Hygiene Highlights—Vol. 1 is now in preparation and is the subject of a special exhibit and announcement at this meeting. In the discussion, Dr. deTreville discussed details of the agreement with Herbick and Held printers and Dr. Cralley as editor, pointing to the possibility of IHF netting up to $25,000 when the entire first edition of volume 1, i.e., 5000 volumes, is sold.

Dr. Cralley was commended by the Chairman of the Board for the manner in which the Engineering Committee is carrying out its programs in support of IHF's mission.

Mr. H. Wilbur Speicher, Westinghouse Electric Corporation, is Co-Chairman of the Engineering Committee and members include:

Frederick H. Deeg
American Mutual Insurance Alliance
N. V. Hendricks
Standard Oil Company (N.J.)
W. H. Kingsley
Sandia Corporation
K. M. Morse
U. S. Steel Corporation
Leo Riconda
General Mills, Inc.
Kenneth E. Robinson
General Motors Technical Center
Elgin D. Sallee
American Can Company
Samuel H. Thomas
Owens-Corning Fiberglas Corp.
Herbert T. Walworth
Lumbermens Mutual Casualty Co.
G. M. Wilkening
Bell Telephone Laboratories

Legal

Mr. Andrew Kalmykow, American Insurance Association, Chairman of the Legal Committee reported that the Committee met in New York on June 19, 1967, to review several items of IHF business with Dr. deTreville, including the proposed agreement with the University of Pittsburgh, the proposed Annual Meeting program, and the proposed Medical Series Bulletin on "The Pneumoconioses." Among other items covered on the agenda were tax credit for industrial hygiene controls, loss of hearing, atomic energy, medicare and medicaid.

Two obligations of the Legal Committee are (1) to keep the Foundation's membership informed and (2) to instill rationality into programs. Plans were discussed for increasing the Committee's involvement in providing services to the membership and, as a first step, a questionnaire is being prepared by Dr. deTreville as a means of obtaining suggestions from the Committee's membership.

Membership of the Committee includes:

William Atkinson
Continental Can Company, Inc.
W. C. Hartman
Squire, Sanders & Dempsey
Theodore Hetzler, Jr.
American Mutual Insurance Allicance
James L. Hill
Ford Motor Company
Edward E. Kuebler
Kuebler & DelDeo
Robert B. Rady
Republic Steel Corporation
C. L. Sheckler
Johns-Manville Corporation
Douglas H. Soutar
American Smelting & Refining C
Frank C. Wachter
Pennsylvania Glass Sand Corp.
P. J. Winschel
Reed, Smith, Shaw & McClay

Medical

Chairman Dr. Daniel C. Braun of the United States Steel Corporation reported that while the Medical Committee had not met as a body during the year, he had met personally on several occasions with Drs. deTreville and Gross in preparing the Annual Meeting Program and Medical Series Bulletin No. 12, "The Pneumoconioses."

Because of the importance of the work in the Research Laboratory, a considerable portion of the discussion has related to that phase of the Foundation s activities. In particular, the work dealing with the biological effects of asbestos and other fibrous materials has been followed closely, and in the Medical and Nursing Session tomorrow afternoon, the paper by Dr. John M. G. Davis of the University of Cambridge will be of interest in this connection.

The Medical Committee has also followed with interest the research directed towards the development of instruction for industrial nurses in the field of mental health. The paper which will be given by Allen Kent in the Chemical-Toxicological Session dealing with a National Industrial Hygiene Information Program is in the process of review as a possible Medical Series Bulletin to be published in the coming year.

Also of great interest to the Committee is the proposal of Dr. Philip E. Enterline, IHF Advisory Fellow, regarding the biostatistical study of morbidity and mortality in industrial populations. The Medical Committee expects to be involved in this study from the standpoint of clinical records, analysis of dispensary visits and diagnostic criteria.

Members of the Committee have been circularized for suggestions regarding Committee activities in the coming year. Projects under consideration are: (1) the rapid increase in medical costs and, consequently, in the costs of insurance programs; (2) the feasibility of including in pre-employment examinations some of the things that are being learned from the on-going studies in mental health; (3) rehabilitation of employees injured on the job; and (4) deterrents to putting physically handicapped employees back to work.

Dr. Carl U. Dernehl, Union Carbide Corporation, is Co-Chairman of the Medical Committee and Dr. Paul Gross of IHF, Secretary. Other members of the committee are:

Miles O. Colwell, M.D.
Aluminum Company of America
Lee B. Grant, M.D.
PPG Industries
Robert J. Halen, M.D.
Jones & Laughlin Steel Corporation
E. M. Kline, M.D.
General Electric Company
George Roush, Jr., M.D.
Ethyl Corporation
O. A. Sander, M.D.
Marquette University
S. D. Steiner, M.D.
General Motors Corporation

Nursing

Miss Alda H. Sica of U. S. Steel Corporation, who accepted Chairmanship of the Nursing Committee when Mrs. Adele (Miller) Brownlee resigned in July, 1967, reported that the Nursing Committee met at Mellon Institute on May 10, 1967, with Mr. Harris Shettel and Mrs. Iva Pleasants of The American Institutes for Research and Dr. deTreville for the purpose of evaluating a comprehensive questionnaire and case study record forms which the Committee Members had completed. The questionnaire and forms will be utilized as tools by the project staff in preparing programmed instruction of mental health principles for the continuing education of the occupational health nurse, under the five-year grant to IHF in the amount of $639, 522 from the National Institute of Mental Health.

The possibility of becoming involved in new programs was discussed by the Committee Members. However, the general consensus was that full cooperation and assistance be given to the present project rather than initiate any new programs at this time.

Other members of the Nursing Committee are:

Adele C. Brownlee, R.N.
General Electric Company
Margaret S. Bruder, R.N.
Allis-Chalmers Company
Dorothy Dean, R.N.
Jones & Laughlin Steel Corp.
Vivian Hatfield, R.N.
Trans World Airlines, Inc.
Helen Kunzler, R.N.
U.S. Steel Corp. (Irvin Works)
Winifred McLanahan, R.N.
Western Psychiatric Institute & Clinic
Iva Pleasants, R.N.
American Institutes for Research
Jean W. Gray, R. N. (ex officio)
Orange Park Florida

Nominating

The Chairman then called on Dr. G. A. Webb, Chairman of the Nominating Committee, to report on this Committee's recommendations. The following change were proposed:

Trustee Emeritus status be awarded Mr. Andrew Fletcher, Dr. Theodore F. Hatch, Dr. H. H. Schrenk, and Dr. Kenneth W. Smith; and that the following new Trustees be elected: Mr. Paul D. Colombo, Mr. John R. Englehorn, Mr. E. W. Merry, Mr. John Vyverberg, and Mr. Edward R. Weidlein, Jr. to fill these spaces and the vacancies created by retirement of Mr. Robert T. Ross and resignation of Mr. Harry M. Bowman and Dr. Henry F. Smyth, Jr. (Dr. Smyth has resigned in view of his retirement from Union Carbide Corporation. He will continue to assist IHF as needed as an Advisory Fellow to Mellon Institute.)

The following slate of nominations for members of the Board of Trustees to serve during the year 1967-1968 was read by Dr. Webb:

Earle T. Andrews
Pennsylvania Glass Sand Corporation

Dr. Anna M. Baetjer
The Johns Hopkins University

Dr. G. L. Barthauer
Consolidation Coal Company, Inc.

Robert D. Blasier
Westinghouse Electric Corporation

Paul D. Colombo
Ford Motor Company

E. K. Davison
Davison Sand & Gravel Company

Frederick H. Deeg
American Mutual Insurance Alliance

Dr. Robert T. P. deTreville
Industrial Hygiene Foundation

John R. Englehorn
St. Joseph Lead Company

Dr. F. Drennan Gassaway
Gulf Oil Corporation

J. S. Harrison
Aluminum Company of America

W. G. Hazard
Owens-Illinois, Inc.

Hugh M. Jackson
Johns-Manville Corporation

Andrew Kalmykow
American Insurance Association

Harold S. McFarland
General Motors Corporation

E. W. Merry
Mine Safety Appliances Company

Dr. Robert B. O Connor
U. S. Steel Corporation

Elgin D. Sallee
American Can Company

Dr. Ralph F. Schneider
Standard Oil Company (N.J.)

Dr. John F. Shronts
General Mills, Inc.

Dr. G. R. Simmons
Western Electric Company, Inc.

Douglas Soutar
American Smelting & Refining Company

Dr. James H. Sterner
Eastman Kodak Company

Leo Teplow
American Iron & Steel Institute

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

John Vyverberg
Owens-Corning Fiberglas Corporation

Dr. G. Arthur Webb
Mellon Institute of Carnegie-Mellon Univ.

Edward R. Weidlein, Jr.
Union Caribde Corporation

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

There being no further nominations, a motion was made by Dr. Webb, seconded by Mr. Clifford L. Sheckler, Johns-Manville Corporation, 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 1968.

There being no discussion and no further business, the meeting was adjourned at 4:30 pm by the Chairman.

H. H. Schrenk

H. H. Schrenk, Ph.D.
Secretary

1968 ANNUAL MEETING DATES

OCTOBER 15-16, 1968

CHATHAM CENTER

PITTSBURGH, PENNSYLVANIA

## I H F MEMBERS

Abrasive Grain Association
Abrasive Products Company
Acme Abrasive Company
Air Preheater Company
Alcolac Chemical Corporation
Allegheny Ludlum Steel Corporation
Allegheny Pittsburgh Coal Company
Allied Chemical Corporation
Aluminum Company of America
American Abrasive Company
American Can Company
American Emery Wheel Works
* American Insurance Association
American Iron and Steel Institute
American Metal Climax, Inc.
American Mining Congress
* American Mutual Insurance Alliance
American Optical Company
American Petroleum Institute
American Potash & Chemical Corp.
American Smelting & Refining Co.
American Welding & Manufacturing Co.
American Zinc Company
American Zinc Institute, Inc.
Anaconda Company
Armco Steel Corporation
Armstrong Paint & Varnish Works, Inc.
Asbestos Textile Institute
Atlas Chemical Industries, Inc.
Automobile Manufacturers Association, Inc.
Avco Bay State Abrasives Division

Frank Bancroft Company, Inc.
Beryllium Corporation
Blanchard Machine Company
Boeing Company
Brush Beryllium Company
Buckeye Abrasive, Inc.
George H. Bullard Company
Bunker Hill Company
Butler County Mushroom Farm, Inc.

Calgon Corporation
  Packwood Manufacturing Co.
  Pittsburgh Activated Carbon Co.
Can Manufacturers Institute, Inc.
Carborundum Company
Celanese Corporation
Central Silica Company
Chayes Dental Instrument Corp.
Chicago Wheel & Manufacturing Co.
Chrysler Corporation
Cincinnati Milling Machine Co.
  Cincinnati Milling Products Division
Robert F. Coleman, Inc.
Colonial Abrasive Products Co.
Comalco Aluminium (Bell Bay) Limited
Companhia Siderurgica Nacional
Consolidation Coal Company, Inc.
Continental Can Company, Inc.
Corn Products Company
Cortland Grinding Wheels Corporation
Creole Petroleum Corporation

A. P. deSanno & Son, Inc.
Diamond Alkali Company
Dow Chemical Company
Dravo Corporation
E. I. du Pont de Nemours & Company

Eastman Kodak Company
Edmar Abrasive Company
Electric Storage Battery Company
  Willson Products Division
Electro Refractories & Abrasives Corp.
Equitable Life Assurance Society of the U.S.
Ethyl Corporation
Exolon Company

Ferro Corporation
FMC Corporation
FMR Corporation
Foote Mineral Company
Ford Motor Company
Foundry Facings Manufacturers Group

Gardner Machine Company
Geigy-Werke Schweizerhalle A.G.
General Abrasive Company, Inc.
General Electric Company
General Grinding Wheel Corporation
General Mills, Inc.
General Motors Corporation
Georgia Kaolin Company
Glenshaw Glass Company, Inc.
Goodyear Tire & Rubber Company
Grinding Wheel Institute
Gulf Oil Corporation
Gypsum Association

Hall China Company
Hamilton Emery & Corundum Company
Hampden Grinding Wheel Company
Hanford Occupational Health Foundation
Hanson Company
Hazleton Laboratories
Hercules, Inc.
  Drakenfeld Division
Hughson Chemical Company

Inland Steel Company
International Business Machines Corp.
International Nickel Company, Inc.
  Huntington Alloy Products Division
ITT Abrasive Products Company

* Multiple Membership

Johns-Manville Corporation
Jones & Laughlin Steel Corporation
Jowitt & Rodgers Company

Kasco Abrasives, Inc.
Kennecott Copper Corporation
Keystone Brass Works, Inc.
Koppers Company, Inc.

Laundry & Cleaners Allied Trades Assn.
Laverack & Haines, Inc.
Lead Industries Association
London Transport Board

Macklin Abrasives Company
Manufacturing Chemists Assn., Inc.
Marcona Mining Company
Maryland Self-Ins. & Empl. Comp. Assn.
J. S. McCormick Company
Merck and Company, Inc.
Metropolitan Life Insurance Company
Mid-West Abrasive Company
Miles Laboratories, Inc.
Mine Safety Appliances Company
Mobil Oil Corporation
Jesse S. Morie & Son, Inc.

Nalco Chemical Company
Freeport Division
National Coal Association
National Crushed Stone Association, Inc.
National Glass Sand Corporation
National Grinding Wheel Company, Inc.
National Industrial Sand Association
National Insulation Manufacturers Assn.
National Lead Company
National Sand & Gravel Association, Inc.
National Slag Association
Nederland du Pont de Nemours N.V.
Norton Company

Osborn Manufacturing Company
Ottawa Silica Company
Owens-Corning Fiberglas Corporation
Owens-Illinois, Inc.

Pacific Grinding Wheel Manufacturing Co.
Pennsylvania Glass Sand Corporation
Pennsylvania Mfrs'. Assn. Ins. Co.
Perkin-Elmer Corporation
Petrobras/RPBC
Portland Cement Association
PPG Industries
Precision Grinding Wheel Co., Inc.

Raybestos-Manhattan, Inc.
Manhattan Rubber Division
Red Hill Grinding Wheel Corporation
Republic Steel Corporation
H. H. Robertson Company

Safety First Supply Company
St. Joseph Lead Company
Sandia Corporation
Sauereisen Cements Company
Sinclair-Koppers Company
Soap and Detergent Association
Sperry Rand Corporation
Louisiana Army Ammunition Plant
Standard Oil Company (Indiana)
Standard Oil Company (New Jersey)
Stauffer Chemical Company
Sturm, Ruger & Company, Inc.
Sugar Beet Products Company

Tata Services Limited
Tennessee Copper Company
Texas Gulf Sulphur Company
Thiokol Chemical Corporation
Reaction Motors Division
Toms River Chemical Corporation

Union Carbide Corporation
United States Potters Association
United States Steel Corporation

Valley Mould and Iron Corporation
Van Straaten Chemical Company
Vesuvius Crucible Company

Wallace-Murray Corporation
Simonds Abrasive Division
Waltham Grinding Wheel Company
Washington Mills Abrasive Company
Wedron Silica Company
Western Electric Company, Inc.
Westfield Grinding Wheel Company
Westinghouse Air Brake Division,
Westinghouse Air Brake Company
Westinghouse Brake and Signal Company, I
Westinghouse Electric Corporation
West Virginia Pulp and Paper Company
Bleached Board Division