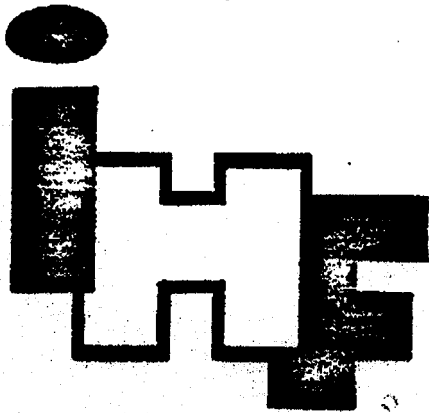


FILE NAME: Industrial Hygiene Foundation (IHF)

DATE: 1970

DOC#: IHF002

DOCUMENT DESCRIPTION: Annual Report



1970 ANNUAL REPORT

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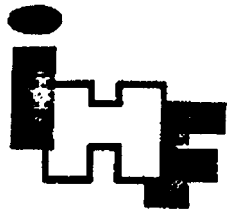
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INDUSTRIAL HEALTH FOUNDATION, INC.

5231 Centre Avenue

Pittsburgh, Pa. 15232



has been a symbol of progress in Industrial Health research and education and in Employee Health Conservation for more than three decades. Because IHF is international and because "health" better describes IHF's functions and programs, our Members overwhelmingly approved IHF Board of Trustees change of name recommendation at a special Membership Meeting, May 19, 1970 from:

Industrial Hygiene Foundation of America, Inc.

to:

INDUSTRIAL HEALTH FOUNDATION, INC.

The symbol, IHF, has not changed, nor have our mission and objectives.

Founded
1935



ROBERT T. P. DETREVILLE, M.D., Sc.D.

PRESIDENT'S MESSAGE TO MEMBERS

The year 1970, which was characterized by unprecedented progress in almost every area of environmental and occupational health in our industrial society, also saw the following major developments in IHF.

- IHF's image has been effectively updated by substitution of "health" for "hygiene" in our name, to cover all aspects of employee health conservation as well as environmental and occupational hazard control and prevention.
- We estimate that one employee in 10 (i. e., 8,000,000) in the United States now benefits directly from various programs of *health research* within our Foundation's membership. All workers, internationally, can benefit indirectly, of course, through IHF publications. IHF's laboratory research role in support of American industry, which is comparable to that of the Armed Forces Institute of Pathology to our military establishment, is growing steadily under Dr. Paul Gross' direction.
- A continuing educational *academic* role for IHF, now emerging, should become no less important to American industry than has been the Industrial College of the Armed Forces to our national security in matters of economic health. The most advanced project in this area now under way is our continuing educational course in employee mental health prepared with the American Institutes for Research for occupational health nurses (under National Institute of Mental Health sponsorship since 1965) which should be introduced into trial use in IHF's membership in 1971. Other instructional courses in preparation (or under consideration) deal with orientation in industrial hygiene for those whose experience has been limited to safety (i. e., how to cope with industrial hygiene provisions of new Federal legislation) and industrial hygiene and safety management for future industrial executives.

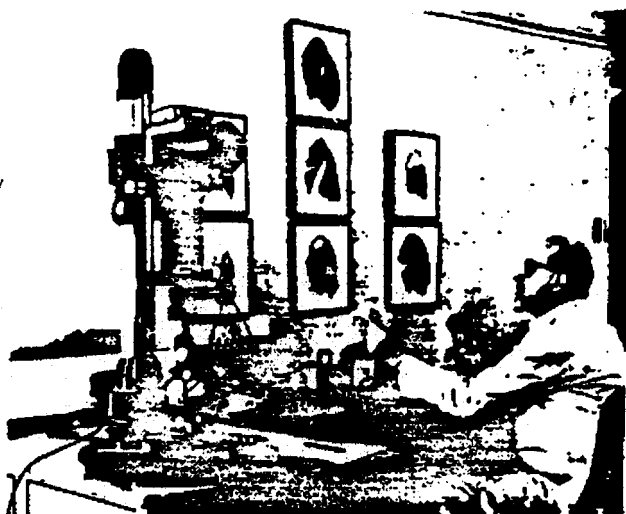
Undoubtedly, our field will be a much larger source of employment in the future, generating need for new forms of training and continuing education in such fields as biostatistics (data collection, storage and retrieval) in support of epidemiological research as well as documentation of compliance with occupational health and safety standards. Among IHF's research programs for 1971 are data collection studies on employee mental health and cigarette smoking and sickness absence. Clinical and environmental information collected by industry—and fed anonymously into IHF's central repository of toxicological data—will have unique value in setting and validation of standards for human exposure, and this program will continue and grow as rapidly as experience and constraints of time and funds will allow and through liaison with organizations such as the American National Standards Institute.

Industrial health gives every indication of being an idea whose time has finally arrived, and we in IHF wish to further its application and real progress in our field to the maximum advantage of all concerned. Companies and industries are being forced by austerity to apply the same type of sound management in the fields of environmental and occupational health that they are using in every other area of productivity and economic loss control. As a result, at a time when more superficial programs of all types are experiencing increasing difficulty in surviving, those which are soundly based (in relation to measurable benefits in employee health and safety for the limited costs incurred) are having a continued—and even an accelerated—growth pattern. The increasing shortage of qualified industrial health personnel at the national level is being more widely recognized as having reached crisis proportions and alternatives to employment full time of qualified occupational health specialists will need to be found. The coming year and decade are bound to witness much greater utilization of non-technical personnel who should perform more effectively, following completion of short courses under the continued competent professional occupational health supervision available within IHF.

In conclusion, let me take this opportunity to express thanks to Foundation members for their past guidance in helping IHF bring into better focus the real health needs of industry's workers today, and to solicit their continued interest and support.

Robert P. de Treville

EXPERIMENTAL RESEARCH



PAUL GROSS, M.D.
Director, IHF Research Laboratories

This research is now conducted chiefly in the Industrial Hygiene Research Unit of the Department of Occupational Health, Graduate School of Public Health, University of Pittsburgh; Department of Pathology of the Medical University of South Carolina; and Mellon Institute of Carnegie-Mellon University.

ALUMINUM

As the scientific literature contains conflicting information on the ability of various types of aluminum powders of respirable size to produce pulmonary fibrosis, in 1968, experimental animals (rats, hamsters and guinea pigs) were exposed. British and United States produced metallic powders via intratracheal injections and inhalation exposure chambers. The first research phase of this IHF project was completed during 1970. Animals not sacrificed at earlier stages were allowed to live out the majority of their life span, i. e., about two years. A report of research findings, now in preparation for publication, sheds some light on the chief apparent conflict resulting from studies in the laboratories. Certain hypotheses, based on results of IHF's findings to date should be subjected to further experimental proof; therefore, our publication presents a preliminary report of progress. (Sponsors: Aluminum Company of America, Reynolds Metal Company, Silberline Manufacturing Company, U. S. Bronze Powders, Inc. and Valley Metallurgical Processing Company, Inc.)

FIBROUS DUSTS

When fibrous dusts are injected intratracheally, polypoid inflammatory lesions develop within a few days in smaller bronchi and bronchioles. These lesions heal and disappear in time. These lesions are factual in the sense that they are not found in animals inhaling the same dusts. It is therefore reasonable to attribute the proliferative polypoid lesions to the particular technique by which the dusts have been introduced into the lungs. This has been published: "The Pulmonary Response to Fibrous Dusts of Diverse Compositions." Paul G. Gross et al. Am. Ind. Hyg. Assn. J. 31:125-132 (May 1970).

The method of quantitating the fibrous dust ferruginous bodies in lungs of Pittsburghers and results obtained was reported at the Third International Symposium on Inhaled Particles (London, September 16-23, 1970) and will be published in the proceedings of this meeting. (Sponsors: Johns-Manville Corporation; PPG Industries; Pittsburgh Corning Corporation; Raybestos-Manhattan, Inc.; U. S. Public Health Service.)

ASBESTOS

Because of an epizootic which decimated the hamsters injected intratracheally with asbestos dust (chrysotile, amosite, and crocidolite) treated in various ways to render the dust metal-free, new animals have been injected with these materials. These new animals are now under observation. The purpose of this study is to determine the local pathogenicity of asbestos dust — particularly its carcinogenicity—the animals will be allowed to live out their lives. (Sponsor: U.S. Public Health Service.)

FIBROUS GLASS

The results of a study of the dust in the lungs of 20 long-term fibrous glass workers has been submitted for publication. The amount of total dust, the number of fibers per gram of dry lung, the dimensions of the fibers in the lungs of the fibrous glass workers were not significantly different from similar data derived from the lungs of Pittsburghers not occupationally exposed to fibrous glass dust.

A new study has been begun on the rate of transport of fibrous dust particles from lung tissue to lymph nodes. Preliminary data indicate that only few fibers are transported to lymph nodes—and these are shorter and thinner than the average fiber found in the lungs. (Sponsors: Certain-teed Products Corporation; Johns-Manville Corporation; Owens-Corning Fiberglas Corporation; PPG Industries.)

LIPID-COATED QUARTZ

The lungs of rats injected intratracheally with quartz dust that had been coated with lipids extracted from the lungs of animals with "acute" silicosis were compared with the lungs of rats injected intratracheally with the same quartz dust but uncoated. Histological examination and chemical determinations of the lipid, hydroxyproline, and silica contents of the lungs disclosed no significant differences. The probable explanation is that the lipid coating on the quartz particles was removed too quickly by natural enzymatic processes. (Sponsor: Department of Health, Education & Welfare, National Institutes of Health.)

COMMUNITY LUNG STUDY

In order to determine the magnitude of the fibrous dust, and particularly, the asbestos dust burden in the lungs of known asbestos workers as well as of people who have not lived in a large metropolis, selected lungs are being collected from people belonging in the above categories. The fibrous dust will be isolated, and quantitated optically according to methods elaborated in IHF's Research Laboratory and published. With the collaboration of Dr. John M. G. Davis of Cambridge, England, aliquots of the fiber suspensions will be examined with the electron microscope for the enumeration of submicronic fibers and the identification of chrysotile fibers. (Sponsor: U. S. Public Health Service, Environmental Control Administration.)

MENTAL HEALTH PROJECT

IHF's continuing education study on occupational mental health and industrial nursing practices is now conducted by the American Institutes for Occupational Health Search is now in its fifth year.

Activities during Years 1 and 2 were concerned primarily with the collection of relevant data on the current status of the role of occupational health nurses in working with the emotional and psychological problems of employees. The third year was devoted to analysis and interpretation of data, the fourth year to the development of instructional materials. During Year 5 efforts will be concentrated on program implementation, i. e., how the course will be packaged and made available to the total population of occupational health nurses.

This project has been supported by a five-year grant from the National Institute of Mental Health and it is anticipated that continuing studies will be needed for maintaining the viability of the course as well as for collecting useful data relating to the extent and types of mental health problems in industry as seen by the occupational nurse (data now available).

IHF/ATMI RESPIRATORY STUDY

A study of cotton textile workers was undertaken by IHF in December 1969 at the request of the American Textile Manufacturers Institute (ATMI) to attempt to determine whether or not there are respiratory problems peculiar to the cotton textile industry in the United States, and, if so, to identify the causative factors and thus permit their control through industrial health and hygiene practices.

A respiratory condition termed byssinosis has been found in other countries, but has been vaguely defined and no specific patho-physiologic or etiologic descriptions have been given. It is characterized by subjective complaints of tightness of the chest, difficulty in breathing which may or may not be accompanied by a significant decline in Forced Expiratory Volume (FEV).

The Foundation's study was designed around a 12-plant matrix into which could be placed prototypes of plants processing only cotton, according to increasing rates of card speed and decreasing grade of cotton.

To elicit reliable information regarding subjective symptoms, it was necessary to construct a questionnaire to be administered to employees when the prototype plants were visited. A bellows-type spirometer was selected for measuring pulmonary function in the field.

The results of replies to questionnaires and pulmonary function tests on all workers tested have been analyzed and compared.

On the basis of the preliminary data it now appears that a specific causative agent may possibly be isolated, perhaps related to the microbiologic components of cotton dust.

SERVICES FOR MEMBERS

ENGINEERING

A plant visit and/or survey requested by a member company can provide management an up-to-date review of the industrial hygiene aspects of its total plant and/or corporate facilities.

Supplementing its broad basic industrial hygiene capabilities, IHF has maintained its relationship with the Mellon Institute of Carnegie-Mellon University in order to be able to utilize its staff and facilities for the analysis of complex airborne contaminants. In searching for the best solution to a unique or specialized problem, IHF obtains expert advice through its Engineering Committee, which includes fully qualified industrial hygiene engineers from a broad sample of industry.

IHF's Engineering Services are one of the important ways in which the Foundation is helping to meet the nation's needs for improved occupational safety and health coverage to plants of all sizes and types in industry.

John A. Jurgiel is IHF's staff Industrial Hygiene Engineer.

OCCUPATIONAL MEDICINE

A medical survey requested by a member company will provide its management with a current review of the occupational health aspects of its total plant and/or corporate facilities.

All medical surveys or consultant visits are followed promptly by a technical report which provides an objective, detailed evaluation of medical aspects of the facilities surveyed, a discussion of any problems or potential problems encountered and recommendations, including steps to be followed to upgrade facilities to acceptable standards of occupational health practice. Such an objective medical



Dust samples are taken as part of each mill survey. Above, John A. Jurgiel, IHF staff Industrial Hygiene Engineer, is adjusting an air sampler.

review is often of value even to companies with staffed occupational health programs.

Through membership in IHF and utilizing services available, a company demonstrates a commitment to act in *good faith* in protecting the health of its employees, which is the basic requirement of the Federal Occupational Safety and Health Act of 1970.

Dr. Daniel C. Braun is Manager of IHF's Occupational Medicine Services.

INFORMATION

The Information Services Department provides photocopies, compiles bibliographies, locates additional sources of information, secures new information from outside collections and carries out literature searches. Simple requests are handled for members while entailed searches are furnished on a cost basis.

With an increasingly rapid production and cumulation of technical and scientific literature on man's environment and on health protection, the assistance of IHF's staff to its members helps them to keep abreast of important changes and innovations.

Mrs. Madeline C. Carey is IHF's Information Specialist and Managing Editor of the *Industrial Hygiene Digest*.

6TH ENGINEERING DISCUSSIONAL

"Environmental Health Hazard Control Plant" was the subject of the 6th Engineering Discussional held at the Flying Carpet Motor Lodge in Pittsburgh on January 13-15, 1970.

Especially designed for plant engineers, covered were: industrial hygiene and plant engineering interface; environmental control regulating plant engineering; environmental controlling procedures in a plant; and a round table discussion: "Plant Engineer! Air your environmental concerns."

Sponsored by IHF's Engineering Committee, discussionals are not limited to engineers only and include all those working on these practical problems and afford an excellent opportunity for open discussion in an "off the record" setting.

MEMBERSHIP SERVICE MEETINGS

IHF headquarters facilities provide an excellent meeting place for members to discuss environmental and occupational health problems on a convenient meeting ground.

Meetings of this type only take place at the request of Foundation members and are structured according to their individual needs. IHF's full staff of occupational health specialists are available to participate if called upon, supplementing experience of industry's own health service personnel.

Members may contact Mr. Harry M. Bowles, Executive Vice President, or any member of the staff to discuss or arrange for such meetings.

PUBLICATIONS (partial listing)

INDUSTRIAL HYGIENE DIGEST

A monthly abstract journal of news, book reviews and abstracts of the world's literature in occupational and environmental health. A monthly index is included and an annual index is published separately. *Distribution is restricted to member companies and to a limited group of subscribers not eligible for regular membership, such as governmental agencies, educational institutions, and hospitals.*

INDUSTRIAL HYGIENE HIGHLIGHTS - Vol. 1

Definitive, full-length reference text in industrial hygiene technology. (Price: \$20.00)

TRANSACTIONS OF ANNUAL MEETINGS

PUBLICATIONS LIST

MEMBERSHIP INFORMATION BROCHURE

ENGINEERING INFORMATION EXCHANGE CAPSULE

TECHNICAL BULLETINS

Chemical-Toxicological Series

8-69: "Suggested Principles and Procedures for Developing Data for Threshold Limit Values for Air"

Legal Series

8-69: "Current Federal Workmen's Compensation and Health and Safety Legislation"

Medical Series

17-70: "Hydrofluoric Acid Burn Management"

Nursing Series

2-69: "Employee Mental Health and Industrial Nursing Practices: A Pilot Study of Current Practices"

INDUSTRIAL ENVIRONMENTAL HEALTH THE WORKER AND THE COMMUNITY

Volume II
of the
Industrial Hygiene Highlights Series

CONTENTS

Introduction	L. V. Cralley, Editor
Heat Stress	Harwood S. Beiding
Closed Ecological Systems	Charles P. Bergtholdt
Engineering	Bernard D. Bloomfield
Personal Protective Devices	William A. Burgess
Air Pollution	George D. Clayton
Epidemiological Studies of Occupational Diseases	Lewis J. Cralley
Ergonomics	Bruce A. Hertig
New and Recurring Health Hazards of Industrial Processes	Joseph A. Houghton
Environmental Evaluation of Chemical Hazards	Robert G. Keenan
Agricultural Products—Their Production, Harvesting and Processing	K. R. Long
Water Pollution	Francis McMichael
Noise	Paul L. Michael
Non-Ionizing Radiation	Isaac Matelsky
Toxicology	Emil A. Pfitzer
The Significance of Off-Job Environmental Health Stresses	Charles H. Powell
Ionizing Radiation	Harry F. Schulte
Meteorology and Industrial Air Pollution	Ray C. Watts

AVAILABLE FALL 1971

36th ANNUAL MEETING

October 12-13, 1971

Chatham Center — Pittsburgh, Pennsylvania

01 133 324

ANNUAL BUSINESS MEETING — IHF MEMBERSHIP

October 13, 1970

4:00 p.m.

Chatham Center

The meeting was opened by Chairman of the Board, Dr. G. A. Webb, who called on Mr. H. M. Bowman for the proxy report. Mr. Bowman reported that sufficient proxies were in hand and in order to constitute a quorum for the conduct of any and all business.

Dr. Webb called for a reading of the minutes of the May 19, 1970, Special Meeting and the October 14, 1969, Business Meeting. On motion by Mr. Edward R. Weidlein, Jr., seconded by Mr. E. K. Davison, the minutes of the two meetings were approved as recorded without reading.

A brief Treasurer's Report was presented by Mr. Bowman.

Mr. John A. Jurgiel reported for the Engineering Committee that the Sixth Engineering Discussional, January 13-15, 1970, was most successful and that plans and program have been completed for the Seventh Engineering Discussional, January 19-21, 1971, at Holiday Motor Inn, Sewickley, Pa., on "Environmental Measurements."

Mr. Andrew Kalmykow reported for the Legal Committee that two new members have joined the committee: Mr. Florian Lux, Ford Motor Company, and Mr. Clarence Stewart, United States Steel Corporation. He counselled that the health field is filled with legal problems and that the laws and regulations should be checked before taking action. He urged members to take advantage of available IHF services.

Mr. Bowman reported for the Nominating Committee, placing the following names before the membership for re-election to the Board of Trustees:

Mr. Robert D. Blasier, Westinghouse Electric Corporation
Mr. Paul D. Colombo, Ford Motor Company
Dr. G. L. Barthauer, Consolidation Coal Company, Inc.
Mr. W. G. Hazard, Owens-Illinois, Inc.
Mr. Hugh M. Jackson, Johns-Manville Corporation
Mr. Eugene W. Merry, Mine Safety Appliances Company
Dr. Robert B. O'Connor, United States Steel Corporation
Dr. G. R. Simmons, Western Electric Company

noting that all but Mr. Colombo had agreed to serve if elected. Mr. Colombo could not be reached before the meeting for confirmation. Mr. Davison moved and Mr. Andrew Fletcher seconded that nominations be closed and the secretary be directed to cast a unanimous ballot. The motion was approved without dissent: *Note:* Late word was received at the close of the meeting that Mr. Colombo could not continue on the Board. His name, therefore, must be deleted from the list above as active Trustee.

Mr. Bowman reported that an attempt to fill three vacancies on the Board for two-year terms had thus far been unsuccessful in time for the meeting of IHF members and that, when candidates were found, a mail ballot would be in order. Mr. Weidlein moved and Mr. Davison seconded that a mail ballot be used to elect Trustees to the Board vacancies. The motion passed without dissent.

Dr. Webb called on Mr. Bowman for an administrative report. Mr. Bowman reported on the following:

1. Initiation of IHF's General Research Fund in 1970 with reasonable success.
2. Invitation to all members to utilize expertise and services available through IHF.
3. Plans to initiate In-Plant Education Seminars in Industrial Health.

The meeting adjourned at 4:27 p.m.

Respectfully submitted,

WAYNE T. BROOKS
Secretary

35th ANNUAL MEETING

October 13-14, 1970

Chatham Center

Pittsburgh, Pa.



IHF's Board Chairman Dr. G. A. Webb, Associate Director of Mellon Institute (CMU) opened the conferences.

Sound employee health management and its relationship to the working population was the theme of IHF's 35th Annual Meeting program. Speakers from industry, government and private agencies gave broad coverage to environmental and occupational health problems affecting industry, and reported progress being made. Transactions of the meeting are in publication.



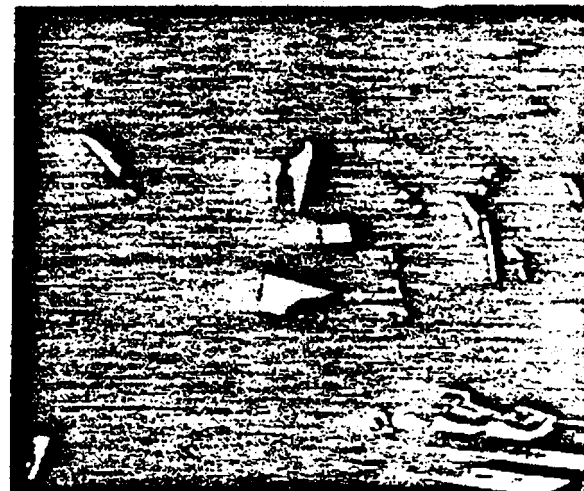
During breaks there is time for informal discussions: Vincent J. Castrop of General Motors chats with IHF Trustee R. Verne Righter of General Motors (above) while IHF Trustee Wayne T. Brooks of American Iron & Steel Institute talks with George E. Flaccus, Jr. of Jones & Laughlin Steel in the foreground of the group photo (right).



IHF Trustee Emeritus, Andrew Fletcher, Honorary Chairman of the Board of St. Joe Minerals Corp. (L) with Rob Kunkle and G. Ronald Nott of St. Joe Minerals.



(L to R) Drs. Leon J. Warshaw, Equitable Life Assurance Society; Edward J. Schowalter, American Telephone & Telegraph; C. Anthony D'Alonzo, DuPont; and Henry F. F. American Medical Association.

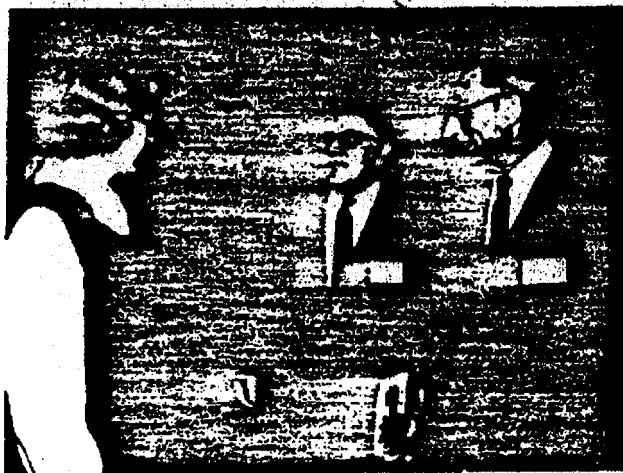




Keynote speaker, Dr. Miles O. Colwell of Alcoa (L) with Management Conference Chairman, Dr. William L. Sutton of Eastman Kodak.



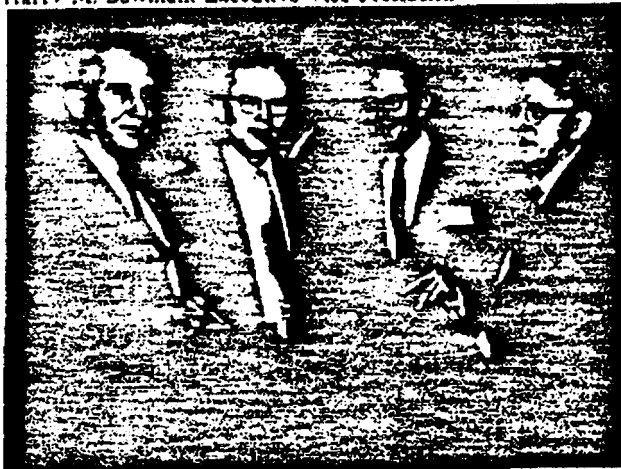
Discussing meeting events are Mrs. Kathleen Kum General Motors and K. W. Nelson of American Smelter Refining.



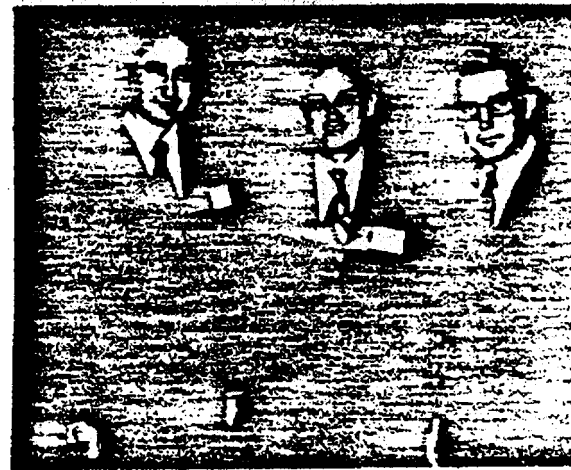
Foundation staff members parley between sessions: Mrs. Madeline C. Carey, Information Specialist; Dr. Daniel C. Braun, Manager of Occupational Medicine Services, and Harry M. Bowman, Executive Vice President.



(L to R) Dr. John V. Grimaldi of the New York University Center for Safety and Howard H. Fawcett, National Academy of Sciences/National Research Council.



(L to R) Dr. H. H. Schrenk, IHF Trustee Emeritus; George D. Clayton, Managing Director of AIHA; William E. Shoemaker of American Mutual Insurance Alliance; and Dr. Lewis J. Crailley of the USPHS.



(L to R) IHF President, Dr. Robert T. P. deTreville. Technical Conference speakers: Dr. J. F. Tomaszewski, Ba Memorial Institute, and Dr. Henry L. Hook of L. County Memorial Hospital.

BALANCE SHEET

ASSETS	Dec. 31, 1969	Dec. 31, 1970
<i>Current Assets</i>		
Short Term Investment	75,000	
Checking Account	65,798	103,336
Inventory (Industrial Hygiene Highlights)		1,200
Petty Cash	500	500
Prepaid Insurance	642	866
Total Current Assets	141,940	105,902
 <i>Fixed Assets</i>		
Land	121,745	121,745
Building and Improvements	95,188	95,188
Furniture and Fixtures	12,162	15,575
Less: Depreciation Reserve	(9,666)	(17,103)
Deferred Expense	2,957	2,730
TOTAL ASSETS	364,326	324,037
 LIABILITIES		
Accounts Payable—Current	12,000	9,696
Advance Collections—Dues	21,175	28,800
—Subscriptions	4,000	1,882
—Research	50,000	40,400
Total Current Liabilities	87,175	80,778
Mortgage Payable	87,661	82,026
Notes and Other	18,773	2,730
Accumulated Surplus	170,717	158,503
TOTAL LIABILITIES AND EQUITY	364,326	324,037

BOARD OF TRUSTEES

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Carnegie-Mellon University

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* Trustee Emeritus

** Past Chairman

† Committee Chairman

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Company (N. J.)

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IHF (Secretary)

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American Insurance Association

Mr. Ashley Cole
Union Carbide
Corporation

Mr. W. C. Hartman
Squire, Sanders
& Dempsey

Mr. Edward E. Kuebler
Kuebler & DeDeo

Mr. Florian A. Lux
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Company

Mr. C. L. Sheckler
Johns-Manville
Corporation

Mr. Douglas Soutar
American Smelting
& Refining Company

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U. S. Steel
Corporation

Mr. James S. Strickles
American Mutual
Insurance Alliance

Mr. Frank C. Wachter
Pennsylvania Glass
Sand Corporation (ITT)

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Baltimore, Maryland

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Dr. Daniel C. Braun
Industrial Health Foundation

Co-Chairman
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Union Carbide Corporation

Dr. Miles O. Colwell
Aluminum Company
of America

Dr. Lee B. Grant
PPG Industries

Dr. Paul Gross
IHF (Secretary)

Dr. Robert J. Haleo
Jones & Laughlin
Steel Corporation

Dr. George Roush, Jr.
Ethyl Corporation

Dr. O. A. Sander
Marquette University

Dr. S. D. Steiner
General Motors
Corporation

Dr. Robert C. Thompson
General Electric
Company

NURSING

Chairman

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U. S. Steel Corporation

Miss Mary Louise Brown, R. N.
U. S. Public Health
Service

Miss Margaret S. Bruder, R. N.
Allis-Chalmers
Company

Mrs. Dorothy Dean, R. N.
Jones & Laughlin
Steel Corporation

Mrs. Helen Kunzler, R. N.
U. S. Steel Corporation

Miss Winifred McLanahan, R. N.
Western Psychiatric
Institute & Clinic

Mrs. Iva Pleasants, R. N. (Sec'y)
Richmond, Virginia

Miss Janet M. Ruff, R. N.
Pa. Dept. of Health

PUBLICATIONS

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Aluminum Company of America

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IHF (Secretary)

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(Member, ex-officio)

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Carnegie-Mellon
University

Mr. Daniel R. Pfoutz
Carnegie Library
of Pittsburgh

Mrs. Glenora E. Rossell
University of Pittsburgh
Libraries

MEMBERSHIP

Chairman

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American Smelting
& Refining Company

Mr. Robert D. Blasier
Westinghouse Electric
Corporation

Mr. Walter P. Cartun
Emhart Corporation

Mr. John R. Englehorn
St. Joe Minerals Corporation

Dr. F. D. Gassaway
Gulf Oil Corporation

Mr. Hugh M. Jackson
Johns-Manville
Corporation

Mr. R. Verne Righter
General Motors
Corporation

Mr. John Vyverberg
Owens-Corning
Fiberglass Corporation

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Cincinnati

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Department—St. Luke's
Hospital

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Wayne University

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University of
Pittsburgh, GSPH

Dr. Philip E. Enterline
Professor of
Biostatistics
University of
Pittsburgh, GSPH

MEMBERS

Date Joined	Company	Date Joined	Company	Date Joined	Company
1937	* Abrasive Grain Association	1937	A. P. deSanno & Son, Inc.	1970	Medical Supply Company
1970	Abrasive Materials Division Norton Company	1952	Diamond Shamrock Corporation	1970	Metal Carbides Corporation
1937	Abrasive Products Company	1939	Dow Chemical Corporation	1949	Metropolitan Life Insurance Co.
1970	Abrasive Division Bendix Corporation	1937	Drakenfeld Division, Hercules, Inc.	1937	Michigan Abrasive Company Grinding Wheel Division
1936	Acme Abrasive Company	1962	E. I. du Pont de Nemours & Co.	1968	Midwestern Coating Corporation
1971	Adamas Carbide Corporation	1966	Eastman Kodak Company	1936	Mine Safety Appliances Company
1936	Allegheny Ludlum Steel Corporation	1963	Edmar Abrasive Company	1949	Mobil Oil Corporation
1936	Allied Chemical Corporation	1943	Electro Refractories & Abrasives Division of Ferro Corporation	1936	Jesse S. Morie & Son, Inc.
1970	Allison Campbell Division American Chain & Cable Co., Inc.	1969	Environmental Sciences, Inc.	1971	Multi Metals, Inc.
1936	Aluminum Company of America	1936	Equitable Life Assurance Society of the United States	1971	National Association of Manufacturers
1969	Aluminum Company of Canada, Ltd.	1937	Ethyl Corporation	1966	National Coal Association
1971	American Apparel Manufacturers Assn.	1937	Exolor Company	1937	National Grinding Wheel Division Federal-Mogul Corporation
1947	American Can Company	1967	Exolor Corporation	1937	National Industrial Sand Association
1938	* American Insurance Association	1949	Ferro Corporation	1966	National Insulation Mfrs. Assoc.
1944	American Iron and Steel Institute	1971	Firth Sterling, A Teledyne Company	1937	National Lead Company
1937	American Metal Climax, Inc.	1937	Foote Mineral Company	1938	National Slag Association
1937	American Mining Congress	1947	Ford Motor Company	1962	Nederland du Pont de Nemours
1945	* American Mutual Insurance Alliance	1936	Foundry Supply Manufacturers' Group	1971	Newcomer Products, Inc.
1944	American Optical Corporation	1963	Freeport Division Nalco Chemical Company	1963	Osborn Manufacturing Company
1967	American Petroleum Institute	1943	Gardner Machine Company	1933	Owens-Corning Fiberglas Corporation
1936	American Smelting & Refining Company	1937	General Abrasive Company	1936	Owens-Illinois, Inc.
1969	American Standard, Inc.	1968	General Asbestos & Rubber Division Raybestos-Manhattan, Inc.	1937	PPG Industries, Inc.
1969	American Textile Mfrs. Institute	1970	General Cigar Company	1934	Pacific Grinding Wheel Company
1936	Anaconda Company	1970	General Dynamics Corporation	1937	Pennsylvania Glass Sand Corporation
1970	Anglo American Corp. of South Africa, Ltd.	1947	General Electric Company	1970	Pneumahl Corporation
1970	Argonaut Insurance Company	1937	General Grinding Wheel Corporation	1938	Portland Cement Association
1965	Armstrong Chemcon, Inc.	1931	General Mills, Inc.	1970	Potters Brothers, Inc.
1969	Asbestos Cement Products Association	1942	General Motors Corporation	1967	Precision Grinding Wheel Co., Inc.
1970	Asbestospray Corporation	1934	Georgia Kaolin Company	1932	Red Hill Grinding Wheel Corporation
1966	Asbestos Textile Institute	1968	Glass Containers Mfrs. Institute, Inc.	1970	Res-Cur Products Company Division of Cleveland Corporation
1970	Atlantic Abrasive Corporation	1937	Glenshaw Glass Company, Inc.	1937	H. H. Robertson Company
1947	Atlas Chemical Industries, Inc.	1967	Goodyear Tire & Rubber Company	1971	Sandvik Steel, Inc.
1968	Auto-Flo Company Division of Masco Corporation	1967	Grinding Wheel Division Norton Company	1936	Sauerisen Cements Company
1936	Automobile Manufacturers Association	1937	* Grinding Wheel Institute	1971	Selenium-Tellurium Development
1937	Avco Bay State Abrasives Division	1930	Gulf Oil Corporation	1967	Simonds Abrasive Division Wallace-Murray Corporation
1970	The Bahnsen Company	1968	Gustin Bacon Division Certain-teed Products Corporation	1966	Sinclair-Koppers Company
1965	Frank Bancroft Company, Inc.	1936	Hall China Company	1936	Soap and Detergent Association
1936	The Boeing Company	1937	Hamilton Division American Abrasive Corporation	1968	Sprayed Mineral Fiber Mfrs. Assn.
1970	Borden, Inc.	1966	Hanford Environmental Health Fdn.	1964	Standard Oil Company (New Jersey)
1971	Bright Boy Industrial Division Weldon Roberts Rubber Company	1967	Hanson Company	1962	Stauffer Chemical Company
1944	Brush Beryllium Company	1937	Huntington Alloy Products Division International Nickel Company, Inc.	1965	Sturm, Ruger & Company, Inc.
1967	Buckeye Abrasive, Inc.	1971	Hydro Carbide Corporation	1933	Sugar Beet Products Company
1932	George H. Bullard Company, Inc.	1947	Inland Steel Company	1968	Systemed Corporation
1961	Butler County Mushroom Farm, Inc.	1947	International Business Machines Corp.	1939	TRW Hazleton Laboratories
1955	CPC International	1970	International Lead Zinc Research Org.	1945	Tata Services Limited
1953	Can Manufacturers Institute, Inc.	1967	ITT Abrasive Products Company	1969	Tenneco, Inc.
1971	Carbide Division, Howmet Corp.	1936	Johns-Manville Corporation	1938	Texas Gulf Sulphur Company
1937	Carborundum Company	1939	Jones & Laughlin Steel Corporation	1960	Toms River Chemical Corporation
1971	Carmer Company	1963	Jowitt & Rodgers Company	1970	Travelers Insurance Companies
1952	Cerianese Corporation	1967	Kasco Abrasives Coleman Systems Company	1971	Tungsten Alloy Mfg. Co., Inc.
1971	* Cemented Carbide Producers Assn.	1933	Kawachi Beryllco Industries, Inc.	1936	Union Carbide Corporation
1937	Central Silica Company	1946	Kennecott Copper Corporation	1970	United States Mineral Products Co.
1967	Chaves Abrasives Division Chaves Dental Instrument Co.	1942	Koppers Company, Inc.	1936	United States Steel Corporation
1937	Chicago Wheel & Manufacturing Co.	1970	Laclede Steel Company	1960	Van Straaten Chemical Company
1938	Ciba-Geigy AG.	1968	Homer Laughlin China Company	1938	Vesuvius Crucible Company
1934	Cincinnati Milacron, Inc. Products Division	1964	Laverack & Haines, Inc.	1971	VR/Wesson Company
1944	Robert F. Coleman, Inc.	1936	Lead Industries Association, Inc.	1971	Walmer Corporation
1951	Colonial Abrasive Products Company	1938	London Transport Executive	1937	Waltham/Hampden Grinding Wheel
1958	Companhia Siderurgica Nacional	1962	Louisiana Army Ammunition Plant Sperry Rand Corporation	1937	Washington Mills Abrasive Company
1936	Consolidation Coal Company, Inc.	1937	J. S. McCormick Company	1937	Wedron Silica Company
1953	Continental Can Company, Inc.	1946	Manhattan Rubber Division Raybestos-Manhattan, Inc.	1971	Wendt-Sonis/Unimet, United Greenfield Div. of TRW, Inc.
1968	Continental Insurance Companies	1966	Manufacturing Chemists Association	1962	Western Electric Company, Inc.
1946	Copperhill Operations Div. of Cities Service Company	1966	Marcona Mining Company	1937	Westfield Grinding Wheel Company
1937	Cortland Division American Abrasive Corporation			1937	Westinghouse Electric Corporation
1962	Creole Petroleum Corporation			1971	Willey's Carbide Tool Company

* Multiple membership
‡ Group membership