



Midwest General Meeting

NOVEMBER 3-7, 1947

CHICAGO, ILL.
Congress Hotel



The Museum of Science and Industry, to be visited on Wednesday afternoon

MEETING FEATURES

THE DINNER-SMOKER will be held at 7:00 p.m., Thursday, November 6, in the Casino Room of the Congress Hotel. A social hour will precede the dinner, starting at 6:00 p.m. Price of the tickets will be \$7.50 each. Reservations for the dinner can be made by mailing check to the Secretary of the Dinner and Entertainment Committee, Mr. F. D. Troxel, care of Sargent & Lundy, 140 S. Dearborn St., Chicago 3, Ill. Reserve tickets can be called for at the registration headquarters. A floor show will follow the dinner. Both the social hour and the dinner will be for men only.

LADIES' EVENTS: On Tuesday afternoon, November 4, there will be an informal lecture tour of the Art Institute, followed by tea in the Institute Club Rooms. The Art Institute houses one of the finest art collections in the United States, including the most complete collection of modern French paintings. Guests will meet at the Congress Hotel at 1:30 p.m. Admission will be by complimentary ticket.

On Wednesday, November 5, the ladies are invited to accompany the men at the Museum of Science and Industry luncheon, which will be followed by a tour of the Museum.

On Thursday afternoon, November 6, there will be a luncheon and bridge party for the ladies at the Saddle and Cycle Club on Chicago's north shore. Buses will leave the Congress Hotel at 12:00 o'clock noon. Reservations are limited to 150. Here again admission is by complimentary ticket. There will be door prizes given at this function. Both the Tuesday and Thursday afternoon parties for the ladies will be financed by contributions from friends of the Institute, to whom formal acknowledgment will be made later.

INSPECTION TRIPS

HISTORIC FISK STATION of the Commonwealth Edison Company is the oldest, dating from 1903, and the second largest, 311,000 kw, in Chicago. At Fisk the progress of steam generating station design during this period is exemplified. Operating side by side are vertical 12,000-kw, 9-kv, 25-cycle turbogenerators in service since 1909, and a modern 147,000-kw, 12-kv, 60-cycle, single-shaft, tandem compound turbogenerator.

Three eras of switchhouse design are represented, including a portion of the original 25-cycle switchhouse, a vertically isolated phase, 60-cycle switchhouse erected in 1925, and a modern horizontally isolated phase switchhouse using metal enclosed switchgear. Two outdoor 69-kv isolated-phase switchyards typify different styles of design.

Buses leave Congress Hotel at 1:30 p.m., Tuesday, November 4. Transportation charge \$1.75.

THE WESTERN ELECTRIC COMPANY'S Archer Avenue Plant is a supply unit of the Bell System, where new Bell Telephones can be seen in the making.

Here powerful presses mold plastic powder into the gleaming shapes familiar to every American, the shapes of the base, the handle, the receiver and transmitter caps of the so-called "combined set." Here the raw materials are machined into hundreds of piece parts from which deft fingers form subassemblies and final assemblies. Here nearly three miles of conveyors "keep the job moving from the initial molding process to final inspection and test, and on to the merchandise department for packing and shipment."

Every phase of the telephone making job is carefully co-ordinated with every other, so that the entire manufacturing process is reduced to a steady consecutive flow—a flow which continues beyond the factory gates, through Western Electric's distributing houses to the telephone companies, and finally to some home or office which the new telephone will link to the nationwide Bell System network.

Buses leave Congress Hotel at 1:30 p.m., Tuesday, November 4. Transportation charge \$1.75. Proof of citizenship is necessary.

CARNEGIE-ILLINOIS STEEL CORPORATION: This U. S. Steel subsidiary plant, the second largest in the world, has an annual steel producing capacity of 4,525,000 net tons, employs 14,000 persons, and covers nearly a square mile of ground. The visitor will see handling of iron ore, coke and limestone; iron produced in blast furnaces; steel made in open hearths; various commercial shapes rolled in various mills; and electric power produced in gas engines.

Buses leave Congress Hotel at 1:00 p.m., Wednesday, November 5. Transportation charge \$1.75. (Continued on page 4)

On arrival Sunday afternoon register in Walnut room—November 3rd to 7th register in Francis I room

MIDWEST GENERAL MEETING—PROGRAM—CHICAGO, ILL., NOVEMBER 3-7, 1947

ADVANCE COPIES OF PAPERS

Members may obtain preprints of technical papers by mail by remitting price indicated to the AIEE Order Department, 33 West 39th Street, New York 18, N. Y.; if purchased at AIEE Headquarters or at the meeting 5¢ less per copy. For convenience an order form is enclosed. Only numbered papers will be available in advance-copy form. Mail orders (particularly from out-of-town members) are advisable, inasmuch as an adequate supply of each paper at the meeting cannot be assured. Most of the papers ultimately will be published as AIEE PROCEEDINGS and in the TRANSACTIONS.

Nonmember prices by mail 100% more than listed less 5c on each paper.

Please order by number and enclose remittance.

Monday, November 3

9:00 a.m.—Registration

10:30 a.m.—Opening General Meeting

Address: "Ceiling Unlimited." Blake D. Hull, President, AIEE

2:00 p.m.—Symposium on Tidd 500-Kv Test Lines—Part I

47-241. Transmission of Electric Power at Extra-High Voltages. Philip Sporn, American Gas & Elec. Serv. Corp.; A. C. Monteith, Westinghouse Elec. Corp. 25 cents by mail.

47-242. Corona Considerations on High-Voltage Lines and Design Features of Tidd 500-Kv Test Lines. C. F. Wagner, Westinghouse Elec. Corp.; Anthony Wagner, American Bridge Co.; E. L. Peterson, I. W. Gross, American Gas & Electric Serv. Corp. 40 cents by mail.

47-243. Insulators and Line Hardware for Tidd 500-Kv Test Lines. I. W. Gross, American Gas & Elec. Serv. Corp.; R. L. McCoy, Locke Insulator Corp.; J. M. Sheadel, Ohio Brass Co. 35 cents by mail.

47-244. Line Conductors—Tidd 500-Kv Test Lines. E. L. Peterson, American Gas & Elec. Service Corp.; D. M. Simmons, General Cable Corp.; L. F. Hickernell, Anaconda Wire & Cable Co.; M. E. Noyes, Aluminum Co. of America. 30 cents by mail.

2:00 p.m.—Industrial Power Systems

47-249. First Interim Report on Interior Wiring Design for Commercial Buildings. Subcommittee on Interior Wiring Design for Commercial Buildings, B. F. Thomas, Jr., Chairman. 40 cents by mail.

CP.* Short-Circuit Calculations for Low-Voltage Industrial Distribution Systems. L. E. Fisher, Bull Dog Elec. Prod. Co.

CP.* Power Supply for Air Conditioning Equipment in Commercial Buildings. M. N. Halberg, D. L. Beeman, General Elec. Co.

Tuesday, November 4

9:00 a.m.—Joint NEC-AIEE Session
(Edgewater Beach Hotel)

Note: The AIEE badge will admit registrants to this session only at the NEC meeting.

CP.* The Convectron, M. A. Babb, Bendix Corp.

CP.* A New Line of Thyratrons. A. W. Coolidge, General Elec. Co.

CP.* The Glass-Enclosed Reed Relay. W. B. Ellwood, Bell Tel. Labs., Inc.

CP.* Capillary-Fed Mercury-Contact Relay. J. T. L. Brown, C. E. Pollard, Bell Tel. Labs., Inc.

9:30 a.m.—Symposium on Tidd 500-Kv Test Lines—Part II

47-245. Transformers and Lightning Arresters—Tidd 500-Kv Test Line. F. A. Lane, American Gas & Elec. Serv. Corp.; J. K. Hodnette, P. L. Bellaschi, E. Beck, Westinghouse Elec. Corp. 20 cents by mail.

47-246. Switchgear Equipment for Tidd High-Voltage Test Line. F. A. Lane, American Gas & Elec. Serv. Corp.; B. W. Wyman, General Elec. Co. 20 cents by mail.

47-247. Instrumentation and Measurement—Tidd 500-Kv Test Lines. R. L. Tremaine, Westinghouse Elec. Corp.; G. D. Lippert, American Gas & Elec. Serv. Corp. 30 cents by mail.

9:30 a.m.—Care and Maintenance of Storage Batteries

CP.* The Care and Maintenance of Storage Batteries on Railroads. R. I. Fort, Illinois Central R.R.

CP.* The Care and Maintenance of Storage Batteries in a Steel Plant. V. E. Schlossberg, Inland Steel Co.

1:30 p.m.—Trip to Fisk Station

1:30 p.m.—Trip to Western Electric Company

1:30 p.m.—Ladies' Trip to Art Institute.

1:30 p.m.—General Session

Address: "Nucleonics," Dr. Enrico Fermi, Dept. of Physics, Univ. of Chicago.

2:30 p.m.—Lighting Session

*Address: "Invitation to attend I.L.E. Conferences and Exhibits at the Hotel Stevens, November 3-7." E. C. Huerkamp, Chairman, 2nd International Lighting Exposition.

Address: "Role of I.E.S. and I.L.E. in Lighting Industry." R. W. Staud, President, Illuminating Engineering Society, and Vice-Chairman, 2nd International Lighting Exposition. Review of Production and Application of Light and Associated Radiations.

CP.* 1. Visible Radiations. R. G. Slauer, Manager, Applications Lab., Sylvania Elec. Prod. Inc.

CP.* 2. Infrared Radiations. E. A. Lindsay, General Elec. Co.

CP.* 3. Ultraviolet Radiations. C. F. Jensen, Westinghouse Lamp Div.

2:30 p.m.—Industrial Control

47-251. A Control System for Wind-Tunnel Drives. A. H. Heidenreich, National Advisory Comm. for Aeronautics. 25 cents by mail.

CP.* Modern Rotogravure Control Systems. G. W. Heumann, General Elec. Co.

CP.* Some Present-Day Practices in Mine Hoist Control. I. W. Cook, G. W. Heumann, General Elec. Co.

CP.* An Electronic Regulator for Electrolytic Processes. W. F. Gerdes, General Elec. Co.

Wednesday, November 5

9:30 a.m.—Power Generation

47-250. Progress in Power Generation, 1940-46. Power Generation Committee. (Presentation by title.) 40 cents by mail.

47-248. Generating Reserve Capacity Determined by the Probability Method. Giuseppe Calabrese, Consolidated Edison Co. of N. Y., Inc. 40 cents by mail.

47-252. Calculating Probability of Generating Capacity Outages. W. J. Lyman, Duquesne Light Co. 30 cents by mail.

47-253. Outage Expectancy As a Basis for Generator Reserve. H. P. Seelye, The Detroit Edison Co. 20 cents by mail.

47-254. Probability Methods Applied to Generating Capacity Problems of a Combined Hydro and Steam System. E. S. Loane, C. W. Watchorn, Pa. Water & Pr. Co. 30 cents by mail.

9:30 a.m.—Conference on Resistance Welding

CP.* Timing Circuits in Resistance Welding Control. B. Sussman.

CP.* Functionalized Resistance Welding Control—Safety Features. C. B. Stadum, Westinghouse Elec. Corp.

CP.* Three-Phase Balanced Load Resistance Welding Machines. D. Sciaky, Sciaky Bros., Inc.

CP.* Various Resistance Welding Systems and Their Effect on the Power Supply. C. E. Smith, Taylor-Winfield Corp.

12:15 p.m.—Trip to Museum of Science and Industry (Ladies included—luncheon at the Museum)

1:00 p.m.—Trip to South Works of the Carnegie-Illinois Steel Company

2:00 p.m.—Transmission, Transformers, and Grounding

47-238. Switching High-Voltage Transmission Lines. I. B. Johnson, J. R. Wilson, General Elec. Co. 35 cents by mail.

47-239. The Application of Storage Batteries to the Control of Switchgear. E. A. Hoxie, Elec. Storage Battery Co. 35 cents by mail.

47-240. Gaseous Insulation for High-Voltage Apparatus. G. Camilli, J. J. Chapman, General Elec. Co. 25 cents by mail.

47-255. Transient Voltage Rise in Transformers Due to Interruption of Exciting Current. A. Srinivasan, Allis-Chalmers Mfg. Co.; F. J. Vogel, Illinois Institute of Technology. 20 cents by mail.

47-237. Present-Day Grounding Practices on Power Systems. AIEE Subject Committee on Present-Day Grounding Practices, the late R. D. Evans, Chairman. 40 cents by mail.

2:00 p.m.—Conference on Energy Sources

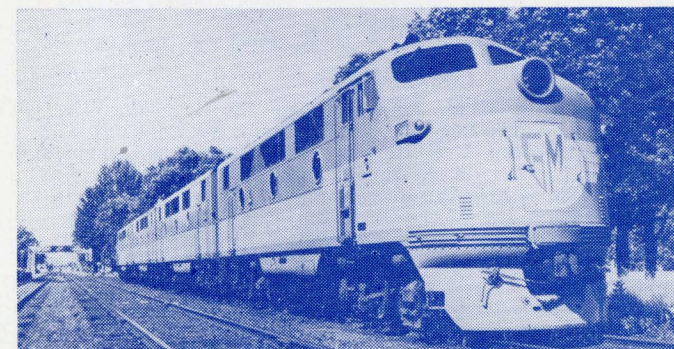
The second of a series of conferences on methods of producing electric power will be sponsored by the Committee on Basic Sciences. The first conference was held during the 1947 AIEE Winter Meeting in New York and three conference papers were presented, which described emission phenomena, piezoelectric phenomena and electrostatic phenomena. At the second conference three more sources of energy will be discussed, namely, electrochemical, magnetostrictive, and thermoelectric, by outstanding experts in their respective fields. The purpose of these conferences is to present to electrical engineers a review of the fundamental principles underlying the various methods of generating electric power by authorities on these subjects. Nuclear fission will not be included in this series of conferences.

CP.* Electrochemical Phenomena. Dr. George W. Vinal, National Bur. of Standards.

CP.* Magnetostrictive Generators. J. A. Osborne, Naval Research Lab.

CP.* Thermoelectric Generators. Grenville B. Ellis, Squier Signal Lab.

7:00 p.m.—Visit to Marshall Field Store. Meet at north entrance at Randolph Street at 7:00 p.m.



The New Wide Range 6,000 Hp F-3 Diesel, Built by the Electro-Motive Division of General Motors. The plant at LaGrange will be visited on Thursday afternoon

Thursday, November 6

10:00 a.m.—General Session

12:00 m.—Ladies' Luncheon and Bridge at Saddle and Cycle Club

1:00 p.m.—Trip to Electromotive Division of General Motors

2:00 p.m.—Trip to Armour Research Foundation

2:00 p.m.—Electronic Relay Applications

This conference, sponsored by the Relay Committee, will be of an exploratory nature, in response to a demand occasioned by the increasing use of electronics in the electric power industry.

A thorough review of the pros and cons of the use of electronics in protective relays is planned. Such a discussion should explain the reluctance of many relay engineers to use electronic protective relays, but more important, should point the way to extended use of such devices, especially where they might provide a facility not hitherto available.

Preceding a general discussion, two conference papers will be presented. The first will deal with the more favorable aspects of electronic relays. The second will reflect the ideas of the committee's working group assigned to this subject. The paper will discuss electronic relaying more generally and will include the less favorable aspects.

CP.* Advantages of Electronic Equipment for Protective Relaying. R. I. Ward, Commonwealth Edison Co.

CP.* The Practical Aspects of Electronic Protective Relaying. J. H. Kinghorn, American Gas & Elec. Serv. Corp.

2:00 p.m.—Communication

47-256. General Mobile Telephone System. H. I. Romnes, American Tel. & Tel. Co.; R. R. O'Connor, Illinois Bell Tel. Co. 25 cents by mail.

CP.* VHF Radio on New York Central Tugs. G. M. Brown, New York Central System.

CP.* Standardization of Transient Response of Television Transmitters and Receivers. R. D. Kell, RCA Laboratories.

CP.* Television R. F. Signal Generator. Joseph Fisher, Philco.

6:00 p.m.—Social Hour

7:00 p.m.—Dinner-Smoker and Entertainment

Friday, November 7

9:30 a.m.—Communication

47-257. The Application of Western Union Multiplex to Navy Radio. Ray Hoover, Western Union Tel. Co. 25 cents by mail.

CP.* RCAC Time Division Multiplex. C. W. Lattimer, RCA Communications.

47-258. Frequency Division Techniques for a Coaxial Cable Network. R. E. Crane, J. T. Dixon, G. H. Huber, Bell Tel. Labs, Inc. 35 cents by mail.

CP.* The New York-Boston Radio Relay Experiment—A Progress Report.

9:30 a.m.—Rotating Machinery

47-259. Suddenly Applied Loads on a Variable-Ratio Frequency Changer. G. K. Carter, Univ. of Virginia; F. J. Maginniss, F. S. Rothe, General Elec. Co. 30 cents by mail.

47-260. Tensorial Analysis and Equivalent Circuit of a Variable-Ratio Frequency Changer. Gabriel Kron, General Elec. Co. 25 cents by mail.

47-261. Resynchronizing of Generators. C. Concordia, M. Temoshok, General Elec. Co. 30 cents by mail.

47-262. Two-Stage Rototrol for Low-Energy Regulating Systems. A. W. Kimball, Westinghouse Elec. Corp. 25 cents by mail.

47-263. The Circle Diagram of the Polyphase Brush Shifting Commutator Motor (Schrage Type). P. W. Franklin, Continental Elec. Co. 25 cents by mail.

9:30 a.m.—Basic Sciences

CP.* A Brief History of Studies in Solar Radiation. J. T. Wilson, Allis-Chalmers Mfg. Co.

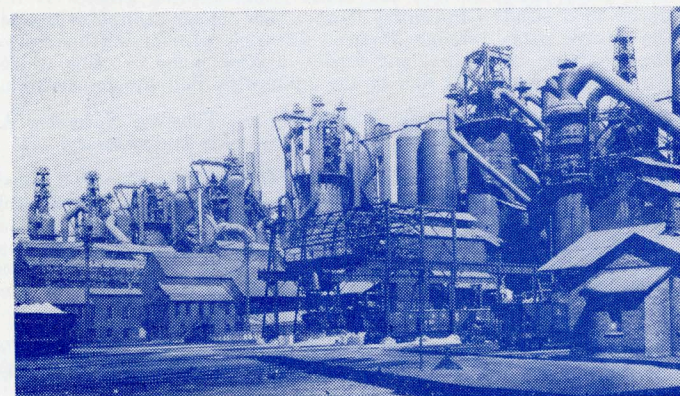
47-264. Ignitor Characteristic and Circuit Calculations. D. E. Marshall, Westinghouse Elec. Corp. 25 cents by mail.

47-265. Determination of Corona Starting Voltages for Nonuniform Fields in Air. J. G. Hutton, General Elec. Co. 35 cents by mail.

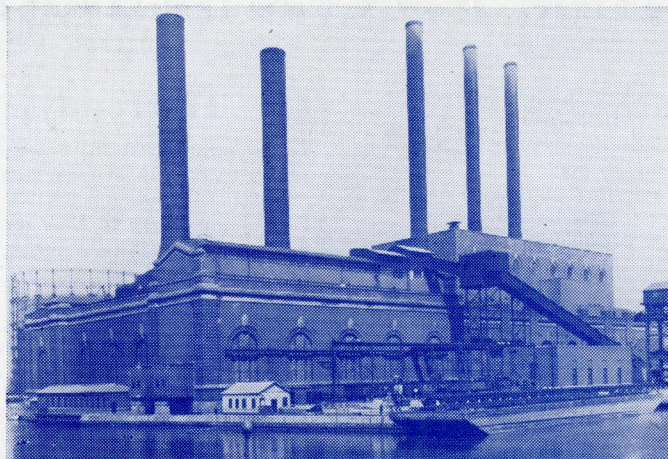
47-266. Diffusion of Electric Current into Rods, Tubes, and Flat Surfaces. K. W. Miller, Armour Research Foundation. 30 cents by mail.

*CP.—Conference paper; no advance copies are available; not intended for publication in TRANSACTIONS.

†ACO.—Advance copies only available; not intended for publication in TRANSACTIONS.



Blast Furnace at the South Works of the Carnegie-Illinois Steel Corporation



The Historic Fisk Generating Station of the Commonwealth Edison Company

THE MUSEUM OF SCIENCE AND INDUSTRY, located in Chicago's Jackson Park at 57th Street and Lake Michigan, is one of the nation's most unique museums. Housed in the old Fine Arts Building of the World's Fair Columbian Exposition and considered to be an architectural masterpiece in the classic style, the museum is a dynamic symbol of man's ingenuity in applying the discoveries of science to industrial productions.

Eight acres of working exhibits draw over a million visitors annually. A working coal mine, a miniature railroad depicting the entire system of one of the nation's largest railroads, a full-size modern farm, a historical collection of old automobiles ranging from 1905 to the early 30's, a graphic arts section, a forestry exhibit where live termites are at work—these and many other scientific and industrial subjects make a trip through this museum an experience long to be remembered.

Buses leave Congress Hotel at 12:15 p.m., Wednesday, November 5. Ladies invited—luncheon and transportation charge \$3.50.

MARSHALL FIELD STORE: For years a legend in the mid-west and in fact throughout the world, Marshall Field & Company probably heads the list of things to see for every visitor who comes to Chicago.

Located at the head of State Street, the huge merchandising organization which covers in Chicago one square block of Loop property has been for 95 years the dominant mercantile force in the city. Now with suburban stores in Oak Park, Evanston and Lake Forest, the Frederick & Nelson store in Seattle, Marshall Field & Company also owns its own textile mills in Fieldale, Va.; Zion, Ill.; and Leaksville, Draper, and Spray, N. C. These mills produce the famed Fieldcrest towels, blankets, sheets, and bedspreads; Karastan rugs; and Zionet curtains and lace tablecloths.

Over 8,000 employees are ordinarily present to serve customers in the main downtown store while during the Christmas season employment rolls increase to 15,000 people. 68 windows on the street level in the main store and the Store for Men, which is a separate five-story store across Washington St. on the Wabash Ave. corner in the 20-story Field Annex, contain merchandise displays world-famed for their color and originality. These are changed on an average of once every ten days.

In the 28 Shop are gowns made by such designers as Hattie Carnegie, Maurice Rentner, Howard Greer, and, exclusively in Chicago, Adrian. Milliners like John Frederics, Lily Dache, Laddie Northridge, Bragaard, and Sally Victor have their hats both in the 28 Shop and the French Room. Usually clothes from the great Parisian and British couture are also available in the 28 Shop.

Visitors are welcomed to the store with its seventh floor devoted to half a dozen restaurants and are especially invited to join the conducted tours through the nine selling floors which begin daily at 10:15, 2:15 and 4.

Guests will meet at Marshall Field Store, north entrance at Randolph Street at 7:00 p.m., Wednesday, November 5. No charge.

ARMOUR RESEARCH FOUNDATION of Illinois Institute of Technology, a not for profit organization, was founded in 1936 to render a confidential and experimental service to Industry, the Government and the general public.

The Foundation consists of three major Divisions: the International Division with headquarters in Mexico City; the Magnetic Recording Division with offices in downtown Chicago; and the Research Division and Administrative offices on Chicago's south side.

The Research Division, which will be open for inspection, is staffed with over 300 people, has seven major Research Departments and one Service Department devoting full time to research. The departments are housed in various offices throughout six buildings; and have completed over 7,000 research projects with some 1,900 companies, Government agencies, and trade and professional associations under the Armour Plan for Industrial Research.

Buses leave Congress Hotel at 2:00 p.m., Thursday, November 6. Transportation charge \$1.75.

THE ELECTRO-MOTIVE DIVISION OF GENERAL MOTORS plant at LaGrange, Illinois, where more than 4,000,000 horsepower of Diesel locomotives have been built, covers 54 acres. It is the birthplace of modern passenger and freight Diesels.

No other locomotive plant in the world has so much modern and specialized machinery and equipment. Many types of manufacturing equipment—the tools used on these valuable machines—and the advanced manufacturing methods have no counterpart elsewhere in the industry.

Four road locomotives are built each working day. With 70,000 parts to a locomotive, this means each working day 280,000 parts are manufactured and assembled for passenger or freight locomotives. In addition, the daily schedule also calls for one switching locomotive.

Buses leave Congress Hotel at 1:00 p.m., Thursday, November 6. Transportation charge \$1.75.

ADVANCE REGISTRATION: Please register in advance by filling in and mailing the enclosed advance registration card. This will assist the registration committee and save time on arrival. As many members as possible should make their plans to arrive on Sunday, November 2, as the registration desk will be open that afternoon in the Walnut Room. All members are requested to mention their attendance at the Midwest General Meeting, when writing to any Chicago hotel for reservations during the period of the meeting. Hotels have been notified and will give priority accordingly. A nonmember registration fee of \$2.00 will be charged all nonmembers except Enrolled Students and the immediate families of members.

H. H. HENLINE, *Secretary*

COMMITTEES

General Committee: F. H. Lane, Chairman; D. L. Smith, Vice-Chairman; F. V. Smith, Secretary; N. C. Percy, Treasurer; D. L. Bement, O. W. Eshbach, J. E. Hobson, L. R. Janes, P. B. Juhnke, T. G. LeClair, J. R. North, R. R. O'Connor, R. I. Parker, H. K. Smith, Earle Wild. **Subcommittee Chairmen:** J. E. Hobson, Hotel; A. J. Krupy, Papers and Meetings; L. R. Janes, Inspection Trips; H. K. Smith, Dinner and Entertainment; R. R. O'Connor, Registration; R. I. Parker, Publicity; P. B. Juhnke, Finance; Mrs. F. H. Lane, Ladies.

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