

47th
Summer
Convention

of the
American
Institute of
Electrical
Engineers



PROGRAM



GROVE PARK INN
Asheville
NORTH CAROLINA

June 22-26, 1931

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Summer Convention



SCHEDULE OF EVENTS including a ladies program, a list of technical sessions together with the papers to be presented at each session, and other information pertaining to trips, sports and social features is given in the following pages.

Additional information on all features of the convention may be obtained at the convention Registration Desk.

Register Promptly

All members and guests should register as soon as possible for each event in which they wish to participate, such as trips, sports, etc.

Annual Business Meeting

The 1931 Annual Business Meeting of the Institute will be held at 10:00 a.m., Monday, June 22. Following an address of welcome by the Mayor of Asheville, the annual report of the Board of Directors will be read in abstract. The Committee of Tellers will announce the election of officers for 1931-1932 and the President-Elect will be introduced. The National Prizes for papers will be presented.

The Lamme Medal which was awarded by the Institute for the year 1930 to Dr. William J. Foster, Schenectady, N. Y. "for his contributions to the design of rotating alternating-current machinery," will be presented to him.

The president's address which will be delivered by President William S. Lee will conclude the meeting.

Conference of Officers, Delegates, and Members

The Conference of Officers, Delegates, and Members will convene at 2:00 p.m., Monday, June 22, and it will be continued at the same hour on the following day. This conference will be attended by Institute officers and delegates, and all members who are interested are invited to participate.

Entertainment

On Monday evening, June 22, at 9:00 p.m., the President's Reception will be held. On the following evening at 7:00 p.m., a Get-Together Dinner will be held and attractive entertainment features will be provided at this dinner. The Convention Banquet is scheduled on Wednesday evening, June 24, at 7:00 p.m. All three of these events will take place at the Grove Park Inn and each of them will be followed by dancing.

Ladies' Entertainment

Besides the foregoing social events an active Ladies' Committee has arranged attractive trips each day for the visiting ladies. Asheville long has been noted for its wonderful climate and the natural beauty of the surrounding country. In conjunction with the trips there will be teas, luncheons and bridge at noted resorts.

Furthermore the facilities of the Biltmore Forest and Asheville Country Clubs will be at the disposal of those attending.

Schedule of Events

EASTERN STANDARD TIME THROUGHOUT

Monday, June 22

- 9:00 a.m. Registration
- 10:00 a.m. Annual Business Meeting of the Institute
Address of Welcome by the Mayor of Asheville
Annual Report of the Board of Directors (in Abstract), by F. L. HUTCHINSON, National Secretary
Report of Tellers Committee on Election of Officers; Introduction of and response from President-Elect
Presentation of Prizes for Papers
Lamme Medal Presentation
President's Address, by W. S. LEE
- 2:00 p.m. Conference of Officers, Delegates, and Members
Qualifying Round for Mershon Trophy, at Asheville Country Club
Tennis at Asheville Country Club
- 2:30 p.m. Ladies' Drive about City followed by Tea at Mountain Meadows
- 9:00 p.m. President's Reception—dancing—at Grove Park Inn

Tuesday, June 23

- 9:00 a.m. Registration
- 9:30 a.m. Two Technical Sessions:
(a) Symposium on Communication Services for Electric Utilities;
(b) Electrical Machinery
- 1:00 p.m. Ladies' Luncheon and Bridge, at Biltmore Forest Country Club
- 2:00 p.m. Conference of Officers, Delegates, and Members (continued)
Sports as scheduled
- 7:00 p.m. Get-Together Dinner, at Grove Park Inn

Wednesday, June 24

- 9:30 a.m. Two Technical Sessions:
(c) Symposium on Interconnections;
(d) Symposium on Electrical Units
- 12:30 p.m. Directors' Luncheon and Meeting, at Grove Park Inn
- 2:00 p.m. Trip to Biltmore House and Estate
Sports as scheduled
- 7:00 p.m. Convention Banquet, at Grove Park Inn

Thursday, June 25

- 9:30 a.m. Two Technical Sessions:
(e) Automatic Stations;
(f) Cables
Semi-Finals in Golf and Tennis
- 2:00 p.m. Technical Session:
(g) Research and Selected Subjects,
Technical Committee Reports
Finals in Golf and Tennis
- 2:30 p.m. Drive to Chimney Rock and Lake Lure Inn
for Tea

Friday, June 26

- All-Day Excursions, choice of:
- (1) Carolina Power and Light Company's
Waterville Plant;
 - (2) Champion Fibre Company and
American Enka Corp.;
 - (3) Mount Pisgah

LADIES' PROGRAM

The ladies are invited to all events, the following being listed
as of special interest to them

Monday, June 22

- 10:00 a.m. Opening of Convention
President's Address, by W. S. LEE
- 2:30 p.m. Drive about City followed by Tea at
Mountain Meadows
- 9:00 p.m. President's Reception—dancing—at
Grove Park Inn

Tuesday, June 23

- 1:00 p.m. Ladies' Luncheon and Bridge at Biltmore
Forest Country Club
- 7:00 p.m. Get-Together Dinner at Grove Park Inn

Wednesday, June 24

- 2:00 p.m. Trip to Biltmore House and Estate
- 7:00 p.m. Convention Banquet, at Grove Park Inn

Thursday, June 25

- 2:30 p.m. Drive to Chimney Rock and Lake Lure Inn
for Tea

Friday, June 26

All-Day Excursions, choice of trips as
scheduled

Technical Sessions

Tuesday

9:30 a.m.—Parallel Sessions A and B

(A) Symposium on Communication Services for Electric Utilities

G. A. Kositzky, *Chairman*
C. O. Bickelhaupt, *Presiding*

Communication Services of Electric Utilities

E. C. BRIGGS
Ohio Bell Telephone Co.
R. N. CONWELL
Public Service Electric & Gas Co.
C. F. CRAIG
American Telephone & Telegraph Co.
G. M. KEENAN
Pennsylvania-New Jersey Interconnection

Communication in the Western Division of the Niagara Hudson System

E. S. BUNDY
Buffalo, Niagara & Eastern Power Corp.

Communication on the Arkansas-Louisiana-Mississippi Interconnected System

E. C. STEWART
Arkansas Power & Light Co.

Communication Facilities of a Metropolitan Power System

P. B. JUHNKE
Commonwealth Edison Co.

Communication Services for the New England Power Association

C. A. BOOKER
New England Power Association
M. E. CLARK
New England Telephone & Telegraph Co.

(B) Electrical Machinery

P. L. Alger, *Chairman*

Reestablishing Excitation of a loaded Alternator in Parallel with Others

D. D. HIGGINS and E. WILD
Commonwealth Edison Co.

Calculation of Synchronous Machine Constants

L. A. KILGORE
Westinghouse Electric & Mfg. Co.

Determination of Synchronous Machine Constants by Test

S. H. WRIGHT
Westinghouse Electric & Mfg. Co.

Transient Oscillations in Distributed Circuits

L. V. BEWLEY
General Electric Co.

Field Transients in Magnetic Systems

ERNST WEBER
Polytechnic Institute of Brooklyn

TECHNICAL SESSIONS—*continued*

Wednesday

9:30 a.m.—Parallel Sessions C and D

(C) Symposium on Interconnections

F. C. Hanker, *Chairman*

Interconnection Services—Their Classification and Evaluation

A. E. BAUHAN
Public Service Electric & Gas Co.

Interconnection—New England District

E. W. DILLARD and W. R. BELL
New England Power Engineering & Service Corp.

The Pennsylvania-Ohio-West Virginia Interconnection

H. S. FITCH
West Penn Power Co.

Interconnection Development and Operation

G. M. KEENAN
Pennsylvania-New Jersey Interconnection

(D) Symposium on Electrical Units

E. J. Rutan, *Chairman*

International Standard of Electromotive Force and Its Low-Temperature Coefficient Form

MARION EPPLEY
The Eppley Laboratory, Inc.

Design of Potentiometers

I. MELVILLE STEIN
Leeds & Northrup Co.

Electrical Units and Their Application

L. T. ROBINSON
General Electric Co.

The Unit of Electrical Resistance; Past History and Impending Change

H. B. BROOKS
Dept. of Commerce, Bureau of Standards
Washington, D. C.

Thursday

9:30 a.m.—Parallel Sessions E and F

(E) Automatic Stations

F. Zogbaum, *Chairman*

An A-C Supervisory Control System

O. K. MARTI
American Brown Boveri Co., Inc.

Supervisory Control for A-C Electrified Railroads

C. P. WEST
Westinghouse Electric & Mfg. Co.
H. C. GRIFFITH
Pennsylvania Railroad Co.

PROGRAM of FORTY-SEVENTH CONVENTION

TECHNICAL SESSIONS—*continued*

Automatic Combustion Control

C. H. SANDERSON and E. B. RICKETTS
The New York Edison Co.

Operating Experience with Automatic Stations

F. F. AMBUHL
Toronto, Hydro-Electric System
GARLAND STAMPER
Columbia Engineering & Management Corp.

Three Years' Operating Experience—With Miniature
Switchboard Supervisory Automatic Control

R. M. STANLEY
Byllesby Engineering & Management Corp.

(F) Cables

P. H. Chase, *Chairman*

Economics of High-Voltage Cable

D. W. ROPER
Commonwealth Edison Co.

Characteristics of Oil-Filled Cable

G. B. SHANKLIN and F. H. BULLER
General Electric Co.

Oil-Filled Cable and Accessories

R. W. ATKINSON and D. M. SIMMONS
General Cable Corp.

Residual Air and Moisture in Impregnated-Paper
Insulation—III

J. B. WHITEHEAD and F. HAMBURGER, JR.
Johns Hopkins University

Insulation Variability—Its Influence in Determining
Breakdown Voltages

M. C. HOLMES
West Virginia University

2:00 p.m.—Session G

**(G) Research and Selected Subjects
Technical Committee Reports**

F. W. Peek, Jr., *Chairman*

Extinction of Short A-C Arcs

T. E. BROWNE, JR.
Westinghouse Electric & Mfg. Co.

A Corona-Tube Voltage Regulator

H. W. DODGE
N. J. Bell Telephone Co.
C. H. WILLIS
Princeton University

Application of the Cooperative Method of Instruction
to Engineering Schools and Polytechnic Institutes

D. C. JACKSON, JR.
University of Kansas

Experimental Studies of Arcing Faults on a 75-Kv.
Transmission System

J. R. EATON
Consumers Power Co.
J. K. PECK
N. E. L. A.
J. M. DUNHAM
American Telephone & Telegraph Co.

Technical Committee Reports

These Reports will be presented by title only and they may be discussed during this session.

AUTOMATIC STATIONS	F. Zogbaum, <i>Chairman</i>
COMMUNICATION	G. A. Kositzky, <i>Chairman</i>
ELECTRICAL MACHINERY	P. L. Alger, <i>Chairman</i>
ELECTRIC WELDING	P. P. Alexander, <i>Chairman</i>
ELECTROCHEMISTRY AND ELECTROMETALLURGY	P. H. Brace, <i>Chairman</i>
ELECTROPHYSICS	O. E. Buckley, <i>Chairman</i>
GENERAL POWER APPLICATIONS	C. W. Drake, <i>Chairman</i>
INSTRUMENTS AND MEASUREMENTS	E. J. Rutan, <i>Chairman</i>
IRON AND STEEL PRODUCTION	A. C. Cummins, <i>Chairman</i>
PRODUCTION AND APPLICATION OF LIGHT	G. S. Merrill, <i>Chairman</i>
APPLICATIONS TO MARINE WORK	R. A. Beekman, <i>Chairman</i>
APPLICATIONS TO MINING WORK	Carl Lee, <i>Chairman</i>
POWER GENERATION	F. A. Allner, <i>Chairman</i>
POWER TRANSMISSION AND DISTRIBUTION	P. H. Chase, <i>Chairman</i>
PROTECTIVE DEVICES	Raymond Bailey, <i>Chairman</i>
RESEARCH	L. W. Chubb, <i>Chairman</i>
TRANSPORTATION	Sidney Withington, <i>Chairman</i>

TRIPS

Friday, June 26, will be devoted to an all-day excursion with a choice of one of the following trips: Carolina Power and Light Company, Waterville plant; Champion Fibre Company and American Enka Corp.; Mount Pisgah.

Waterville Plant

The Waterville plant of the Carolina Power and Light Company is situated on the Big Pigeon River close to the Tennessee state line. A concrete arch dam, 200 ft. high and about 700 ft. long at the top, forms a reservoir from which water is conducted to the plant through a concrete-lined tunnel approximately 33,000 ft. in length. The power house contains three 45,000-kva., 13.8-kv., 400-r.p.m. vertical generator units each directly connected to a 55,000-hp. Francis type waterwheel. The unit system is employed and each generator is connected directly to the step-up bank of transformers without low-voltage oil circuit breakers.

TRIPS—*continued*

Champion Fibre Company

The large Canton, N. C., plant of the Champion Fibre Company serves the paper industry as well as the tanning industry. When chestnut wood is employed as the raw material to produce soda pulp the tannin must first be extracted. The tannin extract unit for this purpose has a capacity of 500 barrels of liquid extract per day. Sulphate pulp is produced in large quantities from the hemlock and spruce. Another mill produces high-grade book, bond, tablet, and envelope papers and has a daily capacity of 100 tons. Chlorine used for the bleaching of pulp is produced by an electrolytic plant having a capacity of 70 tons daily.

The American Enka Corporation

The American Enka Corporation's Rayon plant is an industrial enterprise of recent date. Inspection will be confined to the power plant and village only. The production units will not be open for inspection.

The power plant consists of two Allis Chalmers turbine generators, each of 2200-kw. capacity, supplied by steam from the boiler house equipped with four Babcock & Wilcox boilers of 507 H. P. each and fired by Riley stokers.

Three villages have been created for officials, supervisory employees, and laborers, at the beautiful border of an artificial lake which serves as a settling basin and water storage. All the houses are of the latest design and thoroughly modern in every way.

The capacity of mill is about 20,000 pounds of viscose yarn per day and the factory buildings cover 25 acres of ground.

Mount Pisgah

This mountain with an altitude of 5,749 ft. is the principal high point in the Pisgah National Forest and Game Preserve. Its summit affords a panorama view of Buncombe, Transylvania, Henderson, and Haywood counties, overlooking Little Bald, Big Bald, Cold Mountain, and Eagles Nest. The beautiful mountain laurel and rhododendron also will be in bloom during June. This excursion consists of approximately a 60-mile round trip. Delightful meals and hotel accommodations may be secured at the famous Pisgah Forest Inn, near the top of the mountain.

TRIPS—*continued*

Of the following trips, the first to the Biltmore House and Estate is scheduled for Wednesday at 2:00 p.m., the second to Chimney Rock will take place on Thursday at 2:30 p.m., and the third to the Hydroelectric Development near Columbia, S. C., will be taken on Saturday, June 27, providing a sufficient number of members are interested. If this trip is undertaken further details will be announced during the convention.

Biltmore House and Estate

Because of its magnitude, exquisite architecture, remarkable grounds, gardens and priceless collection of paintings, antiques, and other objects of art, the Biltmore Estate is unique among American country establishments. The house is considered to be the finest private house in America. Approximately 15,000 acres of landscaped park, formal gardens, forest and farm lands of the estate surround the mansion which is now a memorial to George W. Vanderbilt, the founder.

Chimney Rock

Little need be said about this natural phenomenon, which is one of the most famous scenic splendors of the South. Chimney Rock poised on a mountain slope overlooks the blue surface of Lake Lure and affords one an advantageous point from which to view the mountain panorama. Tea will be served at the Lake Lure Inn on this trip.

Hydroelectric Development Columbia, S. C.

Invitations have been cordially extended by the State of South Carolina, the City of Columbia, and the Lexington Water Power Company to visit that state, its capital, and the large 200,000 hp. hydroelectric development on the Saluda River near Columbia.

The Lexington Water Power Company has offered to arrange for transportation from the railroad station to and from the dam where a barbecue will be given.

SPORTS

GOLF

The main event for golfers will be the annual tournament for the Mershon Trophy, which will be played over the course of the Asheville Country Club. This club is near the Grove Park Inn.

It is essential that the qualifying round of the Mershon Trophy tournament be completed on Monday. This will mean that guests arriving after Monday will be unable to enter the Mershon Cup competition.

The competition will consist of qualification round (handicap medal play) of eighteen holes, followed by match play (handicap).

The sixteen low net scores will qualify for the match play rounds, which will be played on Tuesday p.m., Wednesday p.m., and Thursday, a.m. and p.m.

Arrangements will be made by the Committee so that officers, section delegates, et. al., may play their qualification rounds at any particular time on Monday, so as to avoid missing their scheduled meetings.

No greens fees will be charged members or registered guests for any play during the Convention.

TENNIS

The annual Mershon Trophy competition in Men's Singles will be played, together with Men's Doubles, and if sufficient entries can be secured, Ladies' Singles and Mixed Doubles will also be arranged.

These events will be played at the Asheville Country Club and tennis players are assured that excellent courts are available for all who wish to use them.

Entries for all these events should be in the hands of the Committee not later than Monday afternoon.

Rules on Presenting and Discussing Papers

At the technical sessions papers will be presented in abstract, ten minutes being allowed for each paper unless the presiding officer meets with the others preceding the session to arrange the order of presentation and allotment of time for papers and discussion.

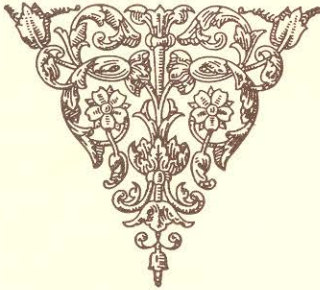
Any member is free to discuss any paper when the meeting is thrown open for general discussion. Usually five minutes is allowed to each discussor.

It is preferable that a member who wishes to discuss a paper give his name before hand to the registration bureau or to the presiding officer of the session at which the paper is to be presented. Copies of discussion prepared in advance should be left with the presiding officer.

Each discussor is to step to the front of the room and announce, so that all may hear, his name and professional affiliations.

NOTICE—Discussions at the technical sessions will not be taken down by a reporter. Each discussor should prepare and submit his remarks in writing. Discussion received by the Editorial Department *within two weeks after presentation of a paper* will be considered for publication.

Written discussion should be mailed to A.I.E.E., Editorial Department, 33 West 39th Street, New York, N. Y.



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