

American Institute of Electrical Engineers



Winter Convention

January 23-27, 1933

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Engineering Societies Building
33 West 39th Street
New York

A.I.E.E.

Winter Convention



MEMBERS AND GUESTS are offered a program of diversified interest which has not been surpassed heretofore. Fourteen technical sessions, a medal presentation, a lecture, dinner-dance, smoker, and various inspection trips comprise the business and social features of the convention. A complete schedule of events and index to details is given on page 2.

Get Tickets at Once

Immediately on arriving at the convention each member and guest should first register and deposit his railroad certificate. When 100 certificates have been validated, announcements will be made and he should then call for his at the desk.

Tickets for inspection trips, the smoker, and dinner-dance should be obtained as early as possible. Tickets for these events are limited in number. Obtaining them well in advance will be very helpful to the committees in charge. For the trips, tickets must be secured by 4 o'clock on the day before the trips are taken.

Information

Information on all features of the convention may be obtained at the registration desk. The Institute rooms and offices on the tenth floor of the Engineering Societies Building are open to members.

Efforts will be made to deliver telegrams and messages promptly. Any mail for members received during the convention will be held at registration desk until called for; letters undelivered at the close of the meeting will be forwarded to latest mailing address.

For the Ladies

In addition to some of the convention features already mentioned, a luncheon and bridge has been arranged at Engineering Woman's Club on Tuesday, January 24, by the ladies' committee, Mrs. E. B. Meyer, chairman. The Alcove on the tenth floor has been reserved for the ladies' headquarters. Information will be available there as to theaters, shopping districts, etc.

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PROGRAM

Monday

10:00 a.m.—Registration

2:00 p.m.—General Session

(In Auditorium)

Opening of Convention:

H. P. CHARLESWORTH, *President*

Presentation:

Alfred Noble Prize to FRANK M. STARR
by ARTHUR S. TUTTLE, *Vice-President*, A.S.C.E.

The Technical Sessions:

W. H. HARRISON, *Chairman*, Technical Program
Committee

2:30 p.m.—(A) Automatic Stations

(In Auditorium)

D. W. TAYLOR, *Presiding*

Pipe Line Pumping and Automatic Control

JOHN FIES, Texas Power and Light Co.

The Principle of Condenser Discharge Applied to
Central Station Control Problems

F. H. GULLIKSEN, Westinghouse Electric & Mfg. Co.

Principles of the Direct-Selection System of Super-
visory Control

M. E. REAGAN, Westinghouse Electric & Mfg. Co.

Improved Power Supply Betters Street Railway
Service

J. A. NOERTKER, The Cincinnati Street Railway Co.

2:30 p.m.—(B) Electric Welding

(Room One, Fifth Floor)

K. L. HANSEN, *Presiding*

High-Velocity Vapor Stream in the Vacuum Arc

R. C. MASON, Westinghouse Electric & Mfg. Co.

New Studies of the Arc Discharge

J. LBLAND MYER, Engineering Foundation Fellow from
Lehigh University

Transients in Arc Welding Generators

A. R. MILLER, Lehigh University

Performance and Design of Electric Welders with
Controlled Transients

F. CREEDY, Lehigh University

High-Frequency Arc Welding Generator

G. A. JOHNSTONE, Great Lakes Electric Mfg. Co., Chi-
cago, Ill.

Tuesday

10:00 a.m.—(C) Communication

(In Auditorium)

H. S. OSBORNE, *Presiding*

Communication Requirements of Railroads

J. L. NIESSE, New York Central Lines and
R. C. THAYER, Great Northern Railroad

Communication System on the Pennsylvania Railroad

I. C. FORSHEE, Pennsylvania Railroad

Railroad Signaling and Train Control

R. B. AMSDEN and W. M. VANDERSLUIS, Illinois
Central Railroad

Modern Signaling on the Reading Railroad

E. W. REICH and G. I. WRIGHT, Reading Co.

Centralized Traffic Control and Train Control of the Baltimore and Ohio Railroad

J. H. DAVIS and G. H. DRYDEN, Baltimore and Ohio
Railroad

10:00 a.m.—(D) Rotating Electrical Machinery

(Room One, Fifth Floor)

S. L. HENDERSON, *Presiding*

Low-Frequency Self-Exciting Commutator Generator

J. I. HULL, General Electric Co.

Some Factors Affecting Temperature Rise in Armatures of Electrical Machines

C. J. PECHHEIMER, Consulting Engineer

Parallel Operation of A-C Generators—Action of Governors and Damper Windings

M. STONE, Westinghouse Electric & Mfg. Co.

Synchronous-Motor Pulling-Into-Step Phenomena

H. E. EDGERTON, G. S. BROWN,
K. J. GERMESHAUSEN and R. W. HAMILTON,
Massachusetts Institute of Technology

Two-Reaction Theory of Synchronous Machines—Part II

R. H. PARK, Calco Chemical Co.

continued

Suggestions to Authors

It is helpful for the authors and presiding officer to meet together before the session starts in order to settle such points as the order of presentation and allotment of time for papers and discussions. It is often convenient to have this preliminary get together at the session location 30 minutes in advance of the scheduled time of the session. Room locations and the presiding officers, names are given just below the session headings in this program. Usually 10 minutes is allowed for the presentation of each paper.

Lantern slides may be left at the registration desk before the session providing they are numbered and in sequence with the author's name and session clearly marked on the outside of the package. They will be delivered to the lantern operator. Please call for them at the registration desk after the session.

Tuesday—continued

2:00 p.m.—(E) Transportation

(In Auditorium)

L. E. MORELAND, *Presiding*

Application of Air Conditioning to Railroad Passenger Cars

W. C. GOODWIN and CHARLES KERR, JR.,
Westinghouse Electric & Mfg. Co.

Calculation of Single Phase Series Motor Control Characteristics

H. G. MOORE and C. J. AXTELL, General Electric Co.

Operation of 3,000-Volt Locomotives on the Cleveland Union Terminals Electrification

F. H. CRATON, General Electric Co. and
H. W. PINKERTON, Cleveland Union Terminals Co.

Power Supply for Main Line Railway Contact Systems

P. A. MCGEE, Reading Railroad Co., and E. L. HARDER,
Westinghouse Electric & Mfg. Co.

Simplified Speed Control for Single-Phase Locomotives

W. A. GIGER, Allis-Chalmers Mfg. Co.

2:00 p.m.—Sound Measurement

(Room 1001)

(Informal meeting for a limited number of engineers especially interested)

Address—Sound Measurement

HARVEY FLETCHER, Bell Telephone Laboratories, Inc.

After discussion there will be a meeting of the A.I.E.E. Committee on Sound

6:00 p.m.—Buffet Dinner and Smoker with Entertainment

SUPPER FROM 6 TO 7:30 P.M. ON 5TH FLOOR
ENTERTAINMENT AT 8 P.M. IN AUDITORIUM

(See details elsewhere in this booklet)

Rules on Discussing Papers

Any member is free to discuss any paper when the meeting is opened for general discussion. Usually 5 minutes are allowed each discussor. When a member signifies a desire to discuss papers on other subjects or groups, he shall be permitted a five-minute period for each subject or group.

Discussors preferably should give their names to the presiding officer beforehand. Discussion prepared in advance should be left with presiding officer. Each discussor should clearly announce from the platform his name and affiliation. If typewritten copies of discussion are not left with the presiding officer, then in order to receive consideration for publication they must be prepared and mailed to the A.I.E.E., Editorial Department, 33 West 39th Street, New York, N. Y., on or before February 10, 1933.

Wednesday

9:30 a.m.—(F) Education

(Room One, Fifth Floor)

R. E. DOHERTY, *Presiding*

Address—The Professional Development of the Engineer

R. I. REES, American Telephone & Telegraph Co.

9:30 a.m.—(G) Insulation Coordination

(In Auditorium)

S. L. HENDERSON, *Presiding*

Progress Report on Impulse Testing of Commercial Transformers

F. J. VOGEL, Westinghouse Electric & Mfg. Co. and
V. M. MONTSINGER, General Electric Co.

Factors Influencing the Insulation Coordination of Transformers

F. J. VOGEL, Westinghouse Electric & Mfg. Co.

Coordination of Insulation

V. M. MONTSINGER, W. L. LLOYD, JR., and
J. E. CLEM, General Electric Co.

Impulse Voltage Testing

C. F. HARDING and C. S. SPRAGUE, Purdue University

Protection of Rotating Alternating-Current Machines against Travelling-Wave Voltages

W. J. RUDGE, JR., R. W. WIESEMAN and W. W. LEWIS

A Recent Development in High-Current Mercury-Arc Rectifiers

E. H. REID and C. C. HERSKIND, General Electric Co.

Synchronous-Mechanical Rectifier-Inverter

S. S. SEYFERT, Lehigh University

11:00 a.m. to 2:00 p.m.

Start of Inspection Trips

(See details elsewhere in this booklet)

(Tickets must be obtained in advance for all trips)

2:00 p.m. Board of Directors' Meeting

(Room 1001, Tenth Floor)

8:15 p.m. Edison Medal Presentation to Bancroft Gherardi

Presiding: H. P. CHARLESWORTH, *President*, A.I.E.E.

History of the Edison Medal: DUGALD C. JACKSON, *Past President*, A.I.E.E., *Chairman*, Edison Medal Committee

Address: GANO DUNN, *Past President*, A.I.E.E.

Presentation of Medal: PRESIDENT CHARLESWORTH

Response: BANCROFT GHERARDI, *Medalist*

Lecture

"Evolution of Society as Influenced by the Engineer," by
DR. J. C. MERRIAM, *President*, Carnegie Institution
of Washington.

Thursday

10:00 a.m.—(H) Lightning

(In Auditorium)

P. H. CHASE, *Presiding*

Recommendations for Impulse Voltage Testing— Lightning and Insulator Subcommittee

PHILIP SPORN, *Chairman*

Lightning Investigation on Transmission Lines— III

W. W. LEWIS and C. M. FOUST, General Electric Co.

Lightning Experience on 132-Kv Lines of the American Gas and Electric Company System

PHILIP SPORN, American Gas and Electric Co.

Impulse and Dynamic Flashover Studies of 26-Kv Wood Pole Transmission Construction

A. S. BROOKES and R. N. SOUTHGATE,
Public Service Electric & Gas Co., and
E. R. WHITEHEAD, Westinghouse Electric & Mfg. Co.

Operating Experience with Wood Utilized as Light- ning Insulation

H. L. MELVIN, Electric Bond and Share Co.

10:00 a.m.—(I) Electrochemistry and Elec- trometallurgy

(Room One, Fifth Floor)

W. C. KALB, *Presiding*

Address—Increasing Applications of Electricity to Chemical Processes

COLIN G. PINK, Columbia University

Light Sensitive Process Control

J. V. ALFRIEND, JR., Westinghouse Electric & Mfg. Co.

Address—Resistance of Storage Battery Separators and the Restivity and Viscosity of Battery Elec- trolytes

GEORGE W. VINAL, Bureau of Standards

Address—High Conductivity Oxygen-Free Copper

P. H. BRACE, Westinghouse Electric & Mfg. Co. and
SYDNEY ROLLE, U.S. Metals Refining Co.

continued

Thursday—continued

2:00 p.m.—(J) Instruments and Measurements

(In Auditorium)

E. J. RUTAN, *Presiding*

†New System of Recording Using Electrical Means

H. L. BERNARDI and L. J. LUNAS,
Westinghouse Electric and Mfg. Co.

Skin Effect in Rectangular Conductors

H. C. FORBES and L. J. GORMAN,
The New York Edison Co.

A Standard of Low Power Factor

W. B. KOUWENHOVEN and L. J. BERBERICH,
The Johns Hopkins University

A Bridge for Precision Power Factor Measurements on Small Oil Samples

J. C. BALSBAUGH and P. H. MOON,
Massachusetts Institute of Technology

Laboratory Measurement of Impulse Voltages

J. C. DOWELL and C. M. FOST, General Electric Co.

The Measurement of High Surge Voltages

P. L. BELLASCHI, Westinghouse Electric and Mfg. Co.

2:00 p.m.—(K) Industrial Applications

(Room One, Fifth Floor)

A. M. MacCUTCHEON, *Presiding*

Circuit Breaker Protection for Industrial Circuits

H. J. LINGAL and O. S. JENNINGS,
Westinghouse Electric & Mfg. Co.

Variable-Voltage Oil Well Drilling Equipment

A. H. ALBRECHT, Standard Oil Co. of Calif.

Recent Developments in Electronic Devices for Industrial Control

F. H. GULLIKSEN, Westinghouse Electric & Mfg. Co.

7:30 p.m.—Dinner-Dance

(In the Ballroom of the Hotel Roosevelt)

RECEPTION IN HONOR OF PRESIDENT CHARLESWORTH
PROMPTLY AT SEVEN-THIRTY

(See details elsewhere in this booklet)

Friday

10:00 a.m.—(L) Protective Devices

(In Auditorium)

R. T. HENRY, *Presiding*

The Use of Communication Facilities in Transmission Line Relaying

J. H. NEHER, Philadelphia Electric Co.

Protection of Electrical Apparatus—Recommended Practise, Relay Subcommittee

O. C. TRAVER, *Chairman*

Application of Phase Sequence Principles to Relaying of Low-Voltage Secondary Networks

H. R. SEARING, The New York Edison Company and The United Electric Light & Power Co. and R. E. POWERS, Westinghouse Electric & Mfg. Co.

A Sequence Relay for Network Protectors

H. S. ORCUTT, United Electric Light and Power Co., and M. A. BOSTWICK, Westinghouse Electric & Mfg. Co.

10:00 a.m.—(M) Selected Subjects

(Room One, 5th Floor)

D. C. JACKSON, *Presiding*

Higher Steam Pressures and Temperatures—A Challenge to Engineers

M. D. ENGLE and I. E. MOULTROP, The Edison Electric Illuminating Co. of Boston

Actions taken by the Symbols, Units, and Nomenclature Committee of the International Union of Pure and Applied Physics in Reference to C.G.S. Magnetic Units

A. E. KENNELLY, Harvard University

Empirical Equations for the Magnetization Curve

J. P. BARTON, Phelps Dodge Copper Products Corp.

†Tensor Analysis of Rotating Machinery

GABRIEL KRON, United Research Corp.

2:00 p.m.—(N) Research and Applied Electronics

(In Auditorium)

CHESTER W. RICE, *Presiding*

The Dielectric Losses in Impregnated Paper

J. B. WHITEHEAD, The Johns Hopkins University

Capacitance and Loss Variations with Frequency and Temperature in Composite Insulation

H. H. RACE, General Electric Co.

A New Method for Initiating the Cathode of an Arc

J. SLEPIAN and L. R. LUDWIG, Westinghouse Electric & Mfg. Co.

Applications of Harmonic Commutation for Thyatron Inverters and Rectifiers

C. H. WILLIS, Princeton University

†This paper will not be published in advance form by the Institute but copies may be made available by the respective authors.

Convention Features

Edison Medal Presentation

The Edison Medal will be presented to Bancroft Gherardi in the Engineering Auditorium at 8:15 o'clock, Wednesday evening, January 25, "for his contributions to the art of telephone engineering and the development of electrical communication."

Lecture

At the conclusion of the Edison Medal ceremonies, Dr. J. C. Merriam, *President* of the Carnegie Institution of Washington, will give an address on "Evolution of Society as Influenced by the Engineer."

Alfred Noble Prize

The Alfred Noble Prize, which was awarded to Frank M. Starr for his technical paper of particular merit entitled "Equivalent Circuits—I," will be presented to him by Arthur S. Tuttle, Vice-President, A.S.C.E. The presentation will take place in a General Session at 2:00 o'clock, Monday afternoon, January 23.

Dinner-Dance

The annual Dinner-Dance will be held this year in the Ballroom of the Hotel Roosevelt on the evening of Thursday, January 26. Promptly at 7:30 o'clock a reception will be held in honor of President Charlesworth. After the reception, dinner will be served in the Ballroom and later there will be dancing to the music of George Ellner's orchestra. Reservations may be made for tables seating eight and ten people. Tickets \$5 per person.

Buffet Dinner and Smoker

The annual Smoker, which will be held in the Engineering Societies Building, Tuesday, January 24, presents a good opportunity to chat with friends and enjoy a number of entertainment features. From 6:00 to 7:30 p.m., on the fifth floor, Schrafft's will serve a buffet dinner. Also from 6:00 to 8:00 p.m. movies will be shown in the Auditorium. Later a variety of entertainment will be offered with Senator James, International Humorologist, Master of Ceremonies. Tickets \$2.75 per person.

INSPECTION TRIPS

The Inspection Trips Committee has completed arrangements for a number of inspection trips and which it is anticipated will prove of interest to the members of the Institute and their guests, either by virtue of their recreational character or from the standpoint of the opportunity afforded to visit neighboring industrial plants and engineering projects.

Effort has been made to include such items as are in any way associated with the character of the technical program to be presented but members are requested to communicate their wishes in this regard to the Inspection Trips Desk if they desire to visit any electrical installations or projects not specifically listed. The Desk will be pleased to render any service in this general regard that may be desired.

Full information on all trips will be furnished at the Desk.

Registration for Trips

Prompt registration for inspection trips is distinctly helpful to the Committee and such registration should be not later than 4 P.M. of the day previous to that of the trip.

Especial attention is called to the necessity for registering promptly for trips Nos. 1 to 3. These are made only on Wednesday afternoon, and the necessity for making arrangements for the accommodation of our members and their guests makes prompt registration imperative.

Time of Starting

The starting time from Convention Headquarters is given for each trip, and announcements will be made by the Desk at the hour of assembly of the different groups. Guides will be furnished in all cases, where necessary, to take the groups to the inspection points.

TRIPS ON WEDNESDAY

- No. 1. Scenic Trip up Hudson River including the famous Storm King Highway, with stop for luncheon at Bear Mountain Inn.

Trip at 11 A.M., Wednesday, January 25th.
Full information furnished at Desk.

- No. 2. To Newark Airport. Inspection of the busiest airport in the world, and flight in twelve-passenger Transport plane.

First busses leave Engineering Building
at 12 noon, Wednesday, January 25th.
Full information furnished at Desk.

- No. 3. New Jersey Industrial Area.

Trip at 12:30 P.M., Wednesday, January 25th.
Transportation provided.

OTHER TRIPS AS INDICATED

- No. 4. Communicating and Signalling Facilities of Railroads, Pennsylvania Railroad at Pennsylvania Station, New York Central Railroad at Grand Central Station.

Trips at 2 P.M., Monday, January 23rd, and Thursday, January 26th.
Full information furnished at Desk.

- No. 5. Operating Rooms of Commercial Telegraph Companies, International Telephone and Telegraph Company, R.C.A. Communications, Inc., Western Union Telegraph Company.

Trips at 2 P.M., Monday, January 23rd and Thursday, January 26th.
Full information furnished at Desk.

- No. 6. Rectifier Substation of Long Island Railroad.

Trip at 9:45 A.M., Thursday, January 26th.
Full information furnished at Desk.

- No. 7. Roseland Switching Station of Public Service Elec. & Gas Co.

Trip at 1 P.M., Tuesday, January 24th.
Transportation provided.

- No. 8. Hudson Avenue Station and Research Laboratory of Brooklyn Edison Company, and neighboring substation and industrial plants.

Trip at 12:30 P.M., Tuesday, January 24th.
Transportation provided.

- No. 9. A.C. Calculating Board of Pennsylvania Railroad located in Pennsylvania Station.

Trips at 2 P.M., Tuesday, January 24th, and Thursday, January 26th.
Full information furnished at Desk.

- No. 10. Electrical Testing Laboratories.

Trips at 10 A.M., Tuesday, January 24th, Wednesday, January 25th, and Thursday, January 26th.
Full information furnished at Desk.

- No. 11. Electrical Research Products, Inc.

Trips at 11:30 A.M., Tuesday, January 24th, and Thursday, January 26th.
Full information furnished at Desk.

- No. 12. Radio City. General inspection of project and of most up-to-date equipment in new Music Hall pertaining to lighting, air conditioning, and operation of unusual features pertinent to theatrical productions.

Trips at 1 P.M., Tuesday, January 24th and Thursday, January 26th.

Full information furnished at Desk.

Anyone desiring to visit any of the following, should communicate their wishes to the Inspection Trips Desk, where effort will be made to arrange for groups at times convenient to the members and our hosts.

- No. 13. East River Generating Station of New York Edison Company.

- No. 14. Hell Gate Station, United Electric Light and Power Co.—Load Ratio Control Equipment. Units in operation for control of voltage and phase angle.

- No. 15. Vertical Distribution in Empire State Building.

- No. 16. New York Museum of Science and Industry, where may be seen the new permanent exhibits relating to power and electrical science and technology.

When visiting the Museum, members should not fail to spend the necessary time in the Lobby of the Daily News Building, in which the Museum is located, to inspect the unique and beautiful permanent information center relating to the weather and the other matters pertaining to the physical world.

- No. 17. Electrical Institute of The Electrical Association of New York, Inc.

Officers of A.I.E.E. 1932-1933

President

H. P. Charlesworth

Junior Past Presidents

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C. E. Skinner

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J. Allen Johnson

L. B. Chubbuck

W. B. Kouwenhoven

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National Treasurer

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W. S. Gorsuch

E. J. Rutan

K. L. Hansen

F. O. Schnure

S. L. Henderson

D. W. Taylor

T. A. Worcester

1933 Winter Convention Committees

GENERAL COMMITTEE

E. B. Meyer, *Chairman*

J. W. Barker	C. R. Jones
T. F. Barton	L. W. W. Morrow
F. M. Farmer	C. E. Stephens
W. H. Harrison	H. R. Woodrow

CONVENTION EXECUTIVE COMMITTEE

C. R. Jones, *Chairman*

C. R. Beardsley	Mrs. E. B. Meyer
R. A. McClenahen	W. R. Smith

DINNER-DANCE COMMITTEE

C. R. Beardsley, *Chairman*

P. L. Alger	S. S. Reynolds
H. L. Huber	H. R. Searing
J. F. Kelly	T. E. Shea
R. F. Penman	D. M. Simmons
C. S. Purnell	George Sutherland
	R. G. Warner

INSPECTION TRIPS COMMITTEE

W. R. Smith, *Chairman*

I. S. Coggeshall	R. D. Parker
G. F. Fowler	H. P. Sleeper
Henry Kurz	R. H. Twiss
H. C. Otten	R. L. Webb

LADIES' COMMITTEE

Mrs. E. B. Meyer, *Chairman*

Mrs. J. W. Barker	Mrs. C. R. Jones
Mrs. T. F. Barton	Mrs. G. L. Knight
Mrs. F. M. Farmer	Mrs. L. W. W. Morrow
Mrs. W. H. Harrison	Mrs. C. E. Stephens
	Mrs. H. R. Woodrow

SMOKER COMMITTEE

R. A. McClenahen, *Chairman*

E. S. Banghart	W. H. Harden
G. D. Edwards	H. C. Schlaikjer
W. H. Farlinger	F. H. Stoppelman
J. E. Goodale	E. F. Thrall
	H. G. Wood

Committee Meetings

Monday, January 23

Room Assignments

10:00 A.M.	Standards.....	1001
11:00 A.M.	Coordination of Institute Activities.....	903

Tuesday, January 24

10:00 A.M.	Subcommittee on Distribution..	903
12:30 P.M.	Automatic Stations (Luncheon Meeting).....	
	Publication (Luncheon Meeting).....	Engineers' Club
2:00 P.M.	Electrical Machinery.....	1101
	Electric Welding.....	1501
	Sound.....	1001

3:00 P.M. Finance..... President's 15th Floor

3:15 p.m. Subcom. Chairmen, Tr. Transmission & Distribution Room 1105

Wednesday, January 25

10:00 A.M.	Subcommittee on Distribution..	903
	Transportation.....	1001
12:30 P.M.	Student Branches	Old London Restaurant
2:00 P.M.	Board of Directors.....	1001
2:30 P.M.	Technical Program.....	1101
2:00 P.M.	<i>Subcom on Mercury Arc Rectifiers</i>	<i>903</i>

Thursday, January 26

9:00 a.m. Authors of Series on Lightning Room 1001

2:00 P.M. Electrochemistry and Electro metallurgy..... President's 15th Floor

	Power Generation.....	1101
2:30 P.M.	Power Transmission and Distribution.....	1001
4:00 P.M.	Education.....	903
7:30 P.M.	Transformer Subcommittee	1001

Friday

2:30 p.m. - Bridging the Gap

Between University and Industry (Dean Barber, Chairman) - N.R.C. 1001