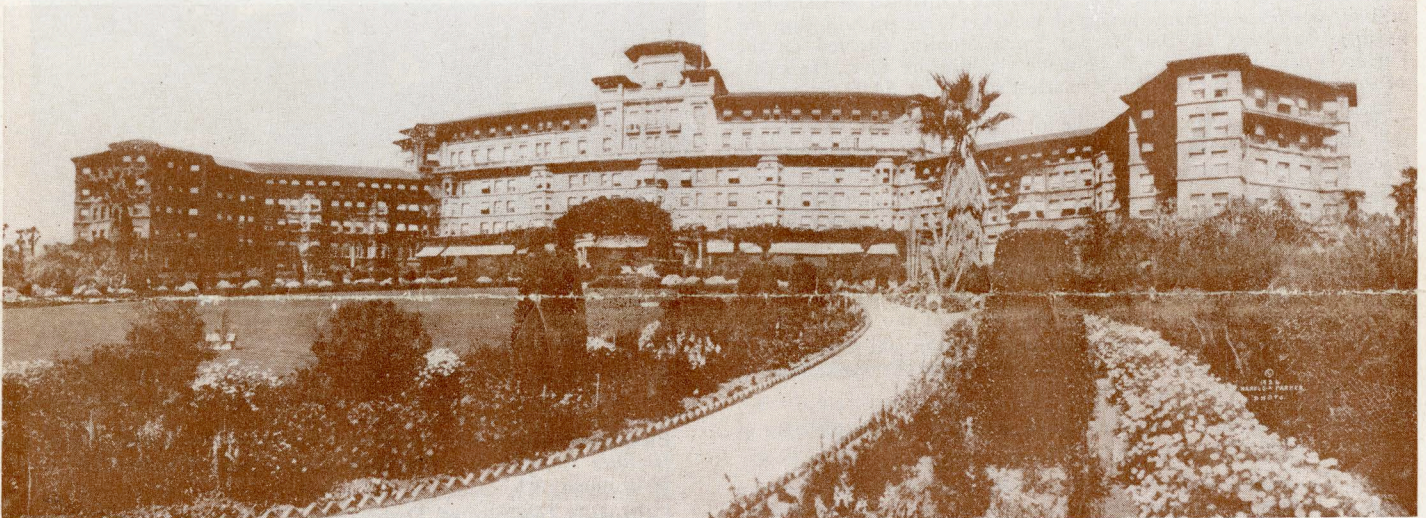




Summer and Pacific General Meeting

June 12-16, 1950

Headquarters
Huntington Hotel
Pasadena, California



Huntington Hotel, Pasadena

CALIFORNIA CENTENNIAL 1850-1950

The 1950 Summer General Meeting has been combined with the Pacific General Meeting usually held in August, to form the 1950 Summer and Pacific General Meeting. The Huntington Hotel in Pasadena has been chosen as the headquarters hotel and the date is June 12-16. Pasadena, situated about ten miles northeast of metropolitan Los Angeles, nestles below the majestic Sierra Madre Mountains. It is a city of culture and education with lovely homes and gardens. Its industry largely consists of plants and laboratories turning out highly scientific precision equipment. It is the home of the world's famous California Institute of Technology. Pasadena's greatest fame probably comes from the annual New Year's Day Tournament of Roses Parade and the Rose Bowl Football Game the same day. Warm days may be expected in June but the evenings are generally cool and the ladies will probably be more comfortable out-of-doors with a light wrap.

TRANSPORTATION: Pasadena hotel guests will find taxicabs or street cars the most convenient method of getting to the Huntington Hotel.

Los Angeles Biltmore Hotel guests can board chartered buses at the Grand Avenue entrance, leaving Monday morning, June 12, at 8:30—9:00—10:00 and 10:30 A.M. and thereafter throughout the week to cover all scheduled day and evening events. Biltmore Hotel bus schedules can be obtained and transportation tickets purchased when registering.

The Pacific Electric Oak Knoll line has a regular stop at the Huntington and can be boarded on Colorado Street in Pasadena or at the 6th and Main Street Station in Los Angeles. This electric line is convenient to the Constance and Green Hotels and the California Institute of Technology dormitories.

STUDENT ACTIVITIES: All Student members are cordially invited to attend all sessions and inspection trips. Student technical sessions will be held on Thursday and Friday mornings. A luncheon for all Student representatives, counselors, and their friends will be held Thursday noon, as guests of the General Electric Company. The luncheon will be followed by a round-table discussion of Student and Branch problems.

The Prize Papers Session will be held Thursday afternoon, with papers presented by the winners of District prizes in the even-numbered Districts.

Students from other areas can arrange for rooms in the dormitories at the California Institute of Technology or elsewhere, by using the attached Hotel Accommodation card.

ENTERTAINMENT

Monday—June 12: Noon luncheon in the banquet room of the Huntington Hotel including tax and tips, \$2.00. Arrangements are being made for a speaker of national prominence in the entertainment field who will speak on a subject in keeping with the social atmosphere that will prevail at this luncheon.

In the evening at 8 P.M. a program of motion pictures will be presented in the theater of the Huntington Hotel. Included on the program will be full color movies of the January 2, 1950 Tournament of Roses Parade. Admission will be free to those in attendance at the meeting.

Tuesday—June 13: An informal barbecue and Aquacade Show totaling, including tax and tips, \$4.00, will be held around the beautiful Huntington Hotel pool in the evening. The Aquacade will consist of beautiful and spectacular performances by expert swimmers and divers, including stars from the American Olympic Team. Following the show, there will be an informal reception for the president on the terrace overlooking the pool.

Wednesday—June 14: Inspection trip to Mt. Wilson.

Thursday—June 15: The social highlight of the meeting is the banquet to be held on Thursday evening around the Huntington Hotel pool. A special program has been arranged to feature well-known stars of the screen, radio, and television with tickets at \$6.50 per person. Since the Huntington Hotel is noted for its excellent cuisine, and Los Angeles is the entertainment capital of the world, it is certain that this night will prove to be the memorable entertainment feature of the meeting. Dress will be informal for this affair as well as all other entertainment features at this summer meeting. No events will be scheduled which will require formal dress for either the ladies or gentlemen.

Since the maximum number who can attend the Monday luncheon meeting, Tuesday night's Aquacade and the Banquet is limited by facilities of the hotel, tickets for these affairs should be purchased at the time of registration. In addition to the above-scheduled entertainment, tickets for radio shows, television shows, and other local entertainment will be available and arrangements for a wide variety of entertainment can be made at the information desk in the lobby of the Huntington Hotel.

AIEE Summer and Pacific General Meeting

LADIES EVENTS

Monday—June 12: An informal garden tea will be held from 3:00 to 5:00 P.M. at the Huntington Hotel, to which all ladies of the meeting are cordially invited.

Tuesday—June 13: Starting in the morning a trip will be made through Hollywood and Beverly Hills where homes of the motion picture celebrities may be seen, with a short stop at Grauman's Chinese Theatre to see the footprints of the stars. Continuing via Sunset Blvd. towards the ocean, past the University of California at Los Angeles and many beautiful homes, the group will stop for luncheon at the Club Del Mar at Santa Monica, situated on the Pacific Ocean. The return will be made via Wilshire Blvd., the locale of some of Southern California's smartest shops. Fee \$4.00 per person.

Wednesday—June 14: In the afternoon a tour will be taken to the world famous Huntington Library, Art Gallery and Botanical Gardens in San Marino, and also the historic old Mission San Gabriel.

Thursday—June 15: In the morning a trip will be made to California's famous orange groves, ending with a conducted tour through a Sunkist orange packing plant. An audience participation show has been arranged for the afternoon by Television Station KFI-TV, to which all ladies are cordially invited.

The men are welcome to participate in all of the ladies' events. Time for visiting and shopping has been allowed and arrangements for other activities may be made on request to the Committee of Ladies at the Information Desk.

SPORTS: Golf and Tennis have been arranged for the pleasure of registered male members and guests.

Golf: The annual golf tournament will be a one-day affair, for men only, of 18-hole medal play. No match play is provided. The tournament will be held at the Brookside Park Golf Course (obtain map at Registration Desk) Tuesday morning, June 13, 1950 for AIEE members registered at the meeting. Players will compete for the Mershon Golf Trophy—Winner 18-hole medal play at Handicap. A suitable prize will be awarded to the Mershon Trophy Winner. Players will be divided into suitable flights and prizes for low gross, low net and several blind bogey prizes will be given in each flight.

AIEE members from Districts 8, 9 and Vancouver, B. C., who are registered at the meeting, will compete for the John B. Fiske Cup—low net 18 holes.

The entry fee of \$3.00 which includes the greens fee is to be paid at the first tee. Transportation will be provided for when desired and must be arranged for at the Golf Registration Desk in advance. Caddies are not available at this course. The committee will try to arrange for caddies if you will so indicate on the registration card.

Tennis: The tennis events will be played on the Huntington Hotel Courts. Events will be arranged for at the Sports Registration Desk for Singles and Doubles play. Keep in touch with this Desk for your pairings. AIEE members and guests who are registered at the meeting will compete for the Mershon Tennis Trophy, and prizes will be awarded to the winner and runner-up. The winner and runner-up of the Doubles Tournament will be awarded suitable prizes. The entry fee will be \$1.00 per person.

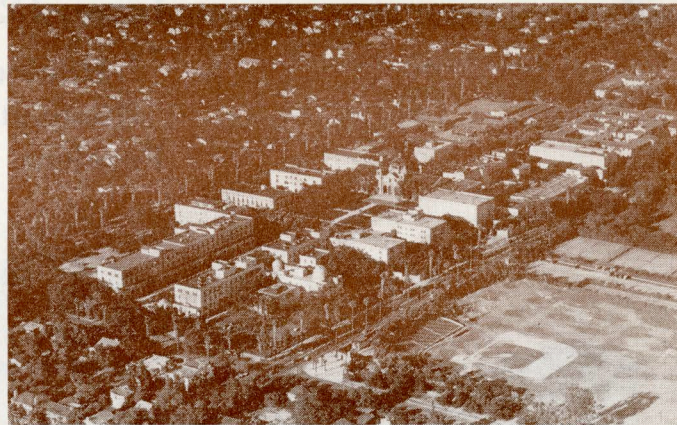
HOUSING ACCOMMODATIONS: All of the housing accommodations except those at the California Institute of Technology have a deadline for reservations of June 1st, so it is essential that you write for reservations to:

Earl S. Condon
1151 S. Broadway
Los Angeles 15, California

based on the information given below. Names of individuals and arrival time must be given in your request.

The Huntington Hotel is the headquarters of the Summer and Pacific General Meeting and the technical sessions and the committee meetings will be held there. The somewhat limited capacity of the Huntington has been reserved for the Institute officers, Section and District representatives and technical committee chairman.

Huntington Hotel—Maximum rates based on double occupancy of each room will be \$12-\$14 per day per person American plan. To utilize the Huntington accommodations to the fullest extent there will be a number of twin double rooms requiring double occupancy in each. These rooms have a bath off of a private passageway between rooms.



California Institute of Technology

Constance Hotel—Pasadena—(Within two miles of Huntington) \$5.00 per day single, \$7.00-\$8.00 per day double European Plan, private bath with every room.

Green Hotel—Pasadena—(Within 2½ miles of Huntington) \$7.00 per day, double occupancy, European Plan. Some suites—double rooms with bath between—same rate.

Pasadena Motels—Recommended for visitors with cars. Rates and facilities variable. Average \$4.00 single, \$5.50 double—\$7.00 triple, \$8.50 quadruple.

California Institute of Technology—Pasadena—(About one mile from hotel.) Dormitory rooms on campus, single occupancy only \$3.00 per day, bath with each four-room groups. Garage free. Breakfast available in Cafeteria on the campus. (For men only).

Los Angeles Biltmore—(About 10 miles and one-half hour from Huntington via Pasadena Freeway.) It is strongly suggested that occupancy start Sunday, June 11. Singles \$7.00-\$10.00 per day. Double \$9.50-\$14.00 per day. Suites \$18.00-\$24.00 and \$30.00 per day European Plan. All private baths.

All reservations must be vacated not later than Saturday, June 17, because the National Shrine Convention has reserved all available hotel accommodations within a 100-mile radius of Los Angeles.

ADVANCE REGISTRATION: It will be helpful to all concerned if the registration card enclosed is filled in and returned promptly. The registration fee will be \$3.00 for members and \$5.00 for non-members. No fees will be required from Students or families of members. Do not enclose remittance. Fees will be collected when registering. For the convenience of those arriving early, the Registration Desk in the Huntington Hotel will be open from 5:00 P.M. to 9:00 P.M., Sunday, June 11.

In accordance with the policy as set up by the Board of Directors, this registration fee is required to help make the meeting self supporting and obviate the need for raising the annual dues.

SUMMER AND PACIFIC GENERAL MEETING COMMITTEE

Fred Garrison <i>Chairman</i>	W. O. Kyte <i>Publicity</i>
M. V. Eardley <i>Vice Chairman</i>	H. A. Lott <i>Technical Programs</i>
E. L. Bettannier <i>Secretary</i>	E. W. Morris <i>Registration</i>
E. S. Condon <i>Hotels</i>	H. F. Rempt <i>Arrangements</i>
Bradley Cozzens <i>Finance</i>	E. W. Rockwell <i>Transportation</i>
Mrs. Fred Garrison <i>Ladies</i>	G. F. Rucker <i>Inspection Trips</i>
F. L. Göss <i>Entertainment and Program</i>	J. H. Vivian <i>Treasurer</i>
G. T. Harness <i>Students</i>	H. S. Warren <i>Sports</i>
	R. A. Hopkins, <i>Vice President Dist. 8</i>
	N. B. Hinson, <i>Director</i>

Continued on page 7

TECHNICAL PROGRAM

ADVANCE COPIES OF PAPERS

Members may obtain preprints of technical papers at the uniform price of 30¢ each (60¢ each to non-members) by sending enclosed order form and remittance to the AIEE Order Department, 33 West 39th Street, New York 18, N. Y. Conference papers denoted by CP** are intended for presentation only, and are not available. Mail orders (particularly from out-of-town members) are advisable, inasmuch as an adequate supply of each paper at the meeting cannot be assured. Coupon books in \$9 denominations are available for those who wish to avoid remittance by check or otherwise. Most of the papers ultimately will be published as AIEE PROCEEDINGS and in the TRANSACTIONS.

Monday, June 12

10:00 a.m.—Opening Ceremony

Introduction of Pacific Coast Institute officers and presentation of Pacific Coast Section delegates, Fred Garrison, General Chairman.

Address of Welcome, Dr. R. W. Sorensen.

10:30 a.m.—Annual Meeting

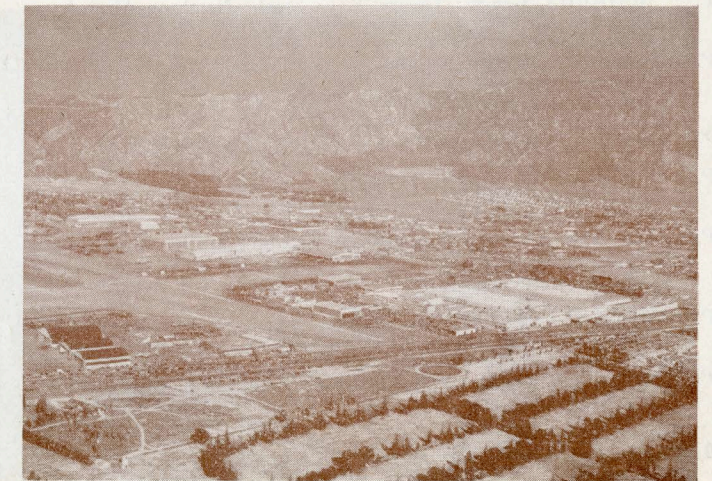
- Report of Board of Directors. H. H. Henline, Secretary.
- Report of Treasurer. W. I. Slichter.
- Report of Committee of Tellers on vote for nominees for AIEE offices.
- (a) Introduction of, and presentation of President's badge to T. G. LeClair.
(b) Response by Mr. LeClair.
- Commemoration of One Hundredth Anniversary of the birth of Oliver Heaviside, Dr. Paul S. Epstein, Professor of Theoretical Physics, California Institute of Technology.
- Presentation of Lamme Medal to C. M. Laffoon, Manager of A-C Engineering Dept., Westinghouse Electric Corp.
 - The Establishment of the Medal. J. B. Thomas, Chairman, Lamme Medal Committee.
 - The Career of the Medalist. A. C. Monteith, Vice-President in charge of Engineering and Research, Westinghouse Electric Corp.
 - Presentation of Medal and Certificate by President Fairman.
 - Response by Mr. Laffoon.
- Any other business that may be presented.
- President's Address. J. F. Fairman.

2:00 p.m.—Petroleum Industry

- CP.** Electric Distribution in the Petroleum Industry. C. M. Hoag, The Fluor Corp., Ltd.
- CP.** Industrial Distribution. M. R. Born, Shell Oil Co.
- CP.** Power Distribution in Chemical Plants. A. M. Selvey, A. F. Zagar, Shell Chemical Corp.
- CP.** Criteria for the Cathodic Protection of Ferrous Materials in Soils. I. A. Dennison, National Bureau of Standards.

2:00 p.m.—Safety

- CP.** 108 are Missing. E. C. Hunt, Pacific Gas and Electric Co.
- CP.** Safety Tests for Electronic Devices. O. G. Wedekind, Underwriters Labs., Inc.
- CP.** Electrical Work Injuries in California Industries. E. E. Carlton, State of California Dept. of Industrial Relations.
- 50-184. Effect of Frequency on Perception Currents. C. F. Dalziel, Univ. of California; T. H. Mansfield, Tracerlab, Inc.
- CP.** Electrical Safety in Experimental Laboratories. C. F. Dalziel, University of California.



Lockheed Aircraft Corp., Burbank, Calif.

2:00 p.m.—Electronics

- CP.** An Oscillograph Amplifier Using a Transducer as the Input Stage. G. W. Downs, Ralph Morrison, William Miller Corp.
- CP.** A Simple Stabilized D.C. Amplifier for Use with Electric Analogue Computers. Vernon Briggs, U. S. Naval Ordnance Test Station.
- CP.** Magnetic Modulators. Gunnar Wennerberg, Lear, Inc.
- CP.** Recent Trends in the Field of Miniature Electronic Components. M. J. Ainsworth, Bendix Aviation Corp.
- CP.** Electronics Goes to the Farm. David Packard, Hewlett-Packard Co.

2:00 p.m.—Conference of Vice Presidents and District Secretaries

Tuesday, June 13

9:30 a.m.—Transmission and Distribution

- 50-143. Progress Report on 500 Kv Test Project of the American Gas and Electric Company—Corona, Radio Influence, and Other Factors. Philip Sporn, American Gas and Electric Service Corp.; A. C. Monteith, Westinghouse Electric Corp.
- 50-141. Desert Measurements of Corona Loss on Conductors for Operation above 230 Kv. W. S. Peterson, Bradley Cozzens, Dept. of Water and Power, The City of Los Angeles; J. S. Carroll, Stanford University.
- 50-135. Long-Distance Power Transmission. S. B. Crary, General Electric Company.
- 50-161. Interrupting Ability of Horn-Gap Switches. F. E. Andrews, L. R. Janes, M. A. Andersson, Public Service Co. of Northern Illinois.

9:30 a.m.—Computers

- CP.** Design Features of the INA Digital Computer. E. Lacey, D. Rutland, H. Larson, H. D. Huskey, National Bureau of Standards.
- CP.** Applications of the INA Digital Computer. H. D. Huskey, National Bureau of Standards.
- CP.** University of California Digital Computer. P. A. Morton, University of California.
- CP.** A High Speed Multiplier for Analog Computers. B. N. Lochanthi, California Inst. of Technology.

- CP.** MADDIDA, General Theory. F. G. Steele, Northrop Aircraft, Inc.
- CP.** MADDIDA, Design Features. D. E. Eckdahl, Northrop Aircraft, Inc.

9:30 a.m.—Planning of New Laboratory Facilities

- CP.** Functional Design of Buildings for Electrical Education. J. D. Ryder, Univ. of Illinois; W. B. Boast, Iowa State College.
- CP.** The New Electrical Engineering Building at the University of California. C. F. Dalziel, T. C. McFarland, R. M. Saunders, Univ. of California.
- CP.** Electrical Engineering Building at Oregon State College Features Functional Design. B. H. Nichols, Oregon State College.
- CP.** A Water Rheostat Using Untreated Water. J. F. Engle, Oregon State College.

9:30 a.m.—Land Transportation

- 50-180. Power, Pull, and Performance of Electric Locomotives. A. H. ACO.* Candee, Westinghouse Electric Corp.
- 50-181. Locomotive Wheel-Slip and Wheel-Lock Protection. R. M. Smith, General Electric Co.
- 50-182. A New Resilient Class 'H' Material for the Insulation of Traction Motor Field Coils. J. R. Reed, National Electric Coil Co. of Columbus, Ohio; J. J. Tyner, Dow-Corning Corp.

9:30 a.m.—Section Delegates Conference

2:00 p.m.—Relays and Transmission and Distribution

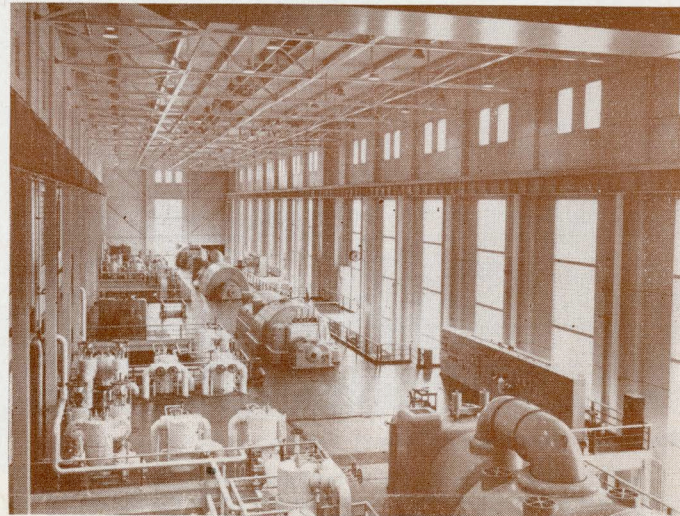
- 50-130. Thirteen-Year Lightning Performance of Boulder 287.5 Kv Transmission Lines. T. M. Blakeslee, E. L. Kanouse, Dept. of Water and Power, The City of Los Angeles.
- 50-163. Methods of Estimating the Lightning Performance of Transmission Lines. Lightning and Insulator Subcommittee.
- 50-164. The Bonneville Power Administration Relaying and Reclosing Program. C. C. Diamond, D. L. Wylie, Bonneville Power Administration.
- 50-140. Relaying Practices and Economical Switching Station Arrangements of the Bureau of Reclamation. W. A. Morgan, R. W. World, Bureau of Reclamation.

2:00 p.m.—Applications of Computers to Aircraft Engineering Problems

- CP.** Automatic Data Handling Techniques Including Recording and Reduction. W. D. Bell, Telecomputing Corp.
- CP.** Electric Analog Computing Techniques for Complex Vibration and Aeroelastic Problems. G. D. McCann, R. H. MacNeal, California Inst. of Technology.
- CP.** Use of Analogy Computing Techniques for Aeroelastic Problems. P. A. Dennis, D. G. Dill, Douglas Aircraft Company.
- CP.** Complex Missile Control System Design and Analysis with the Electric Analog Computer. J. P. Brown, Lear, Inc.; C. H. Wilts, California Inst. of Technology.
- CP.** Solution of Problems in Electrical Engineering by Means of Analogue Computers. L. L. Grandi, D. Lebell, University of California.

2:00 p.m.—Western Mining Applications

- CP.** Hard Rock Mining, San Manuel Project. R. P. Diehl, Magna Copper Corp.
- CP.** Mining and Refining of Potash. G. T. Harley, International Minerals and Chemical Corp.



Turbine Room — Redondo Steam Station
Southern California Edison Company

- CP.** Development of the D-C Haulage System for Morenci Mine. Felix Berra, Phelps-Dodge Corporation; Roy Call, Westinghouse Electric Corp.
- CP.** Processes and Equipment for the Garfield Refinery. R. J. Corfield, Kennecott Copper Corp.

2:00 p.m.—Section Delegates Conference

Wednesday, June 14

9:30 a.m.—Transformers

- 50-165. Transformer Oil. E. D. Treanor, E. L. Raab, General Electric Co.
- CP.** Selection of Cooling and Oil Preservation for Power Transformers. J. A. Elzi, Commonwealth Associates, Inc.
- 50-166. Development of Preferred Voltage Ratings for Transformers. H. P. St. Clair, American Gas and Electric Service Corp.; H. M. Jalonack, General Electric Co.
- CP.** Selection, Application, and Operation of Large Power Transformers on Southern California Edison Co. System. C. L. Sidway, L. H. Beebe, Southern California Edison Co.
- CP.** General Considerations for Banking of Distribution Transformers. F. I. Nagle, N. K. Yarnell, Southern California Edison Co.
- 50-167. Engineering and Economic Considerations Applicable to Large ACO.* Power Transformer Installations. C. M. Short, Dept. of Water and Power, The City of Los Angeles; W. G. Hart, General Electric Co.

9:30 a.m.—Western Mining Applications

- CP.** Electronic Communication Systems for Mine Shafts. C. M. Marquardt, Combined Metals Reduction Co.
- CP.** Conveyor Haulage and Hoisting. C. A. R. Lambley, Pend O'Reille Mines and Metals Co.
- CP.** Electricity in Underground Copper Mines. Rollin Kennard, Anaconda Copper Mining Co.
- CP.** A Low Voltage Ground Protector Relay for Mine Use. A. B. Chafetz, International Minerals and Chemical Corp.

9:30 a.m.—Particle Acceleration and Detection

- CP.** Cloud Chamber Studies of Cosmic Rays. O. D. Anderson, California Inst. of Technology.

- CP.** Operation of the 350 MEV Berkeley Synchrotron. Marvin Martin, University of California.
- CP.** A 500 Kv Radio Frequency Power Supply as a Bevatron Injector. J. R. Woodyard, University of California.
- CP.** The Klystron as a High Power Source for the Electron Linear Accelerator. Simon Sonkin, Stanford University.
- CP.** Proton Linear Accelerators. W. K. H. Panofsky, University of California.

9:30 a.m.—Telephone Switching

- 50-168. Interexchange Tandem Trunking in the Los Angeles Metropolitan Area. W. F. Pfeiffer, The Pacific Telephone and Telegraph Co.
- 50-153. Crossbar Tandem System. R. E. Collis, Bell Telephone Laboratories, Inc.
- 50-169. Universal Director in Strowger Automatic Telephone Systems. J. E. Ostline, Automatic Electric Co.

2:00 p.m.—Transformers

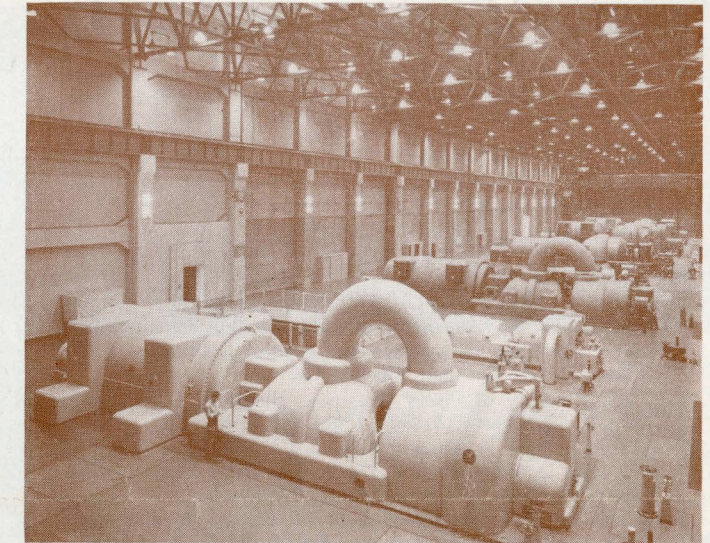
- 50-129. Selection, Design, and Operation of Power Transformers on American Gas and Electric Company System. F. A. Lane, I. W. Gross, P. S. Pugh, American Gas and Electric Service Corp.
- 50-134. Selection and Application of Power Transformers. H. P. Seeley, The Detroit Edison Co.
- CP.** Selection of Substation Transformers for Growing Loads. R. E. Pierce, F. C. Poage, Ebasco Services, Inc.
- CP.** Economics of Power Transformer Application. J. E. Barkle, R. L. Witzke, Westinghouse Electric Corp.
- 50-128. The Choice of Main Power Transformers for Generating Stations. N. E. Dillow, J. W. Butler, General Electric Co.
- 50-178. Transformer Sound Level Considerations. A. J. Maslin, Westinghouse Electric Corp. Presentation by title only.
- 50-179. Quiet Transformer Installations—A Problem for Both Equipment and Substation Designers. I. S. Mendenhall, F. L. Taylor, The Detroit Edison Co. Presentation by title only.

2:00 p.m.—Electronics

- CP.** Use of Reflection Doppler Techniques for Test Range Instrumentation. David Kean, U. S. Naval Ordnance Test Station.
- CP.** Application of Electronics to Test Range Instrumentation. Frederick Ashbrook, U. S. Naval Ordnance Test Station.
- CP.** A Precision Timing System for Test Range Instrumentation. Thomas Parkin, U. S. Naval Ordnance Test Station.
- CP.** Sound Ranging at the Morris Dam Torpedo Ranges. R. N. Skeeters, U. S. Naval Ordnance Test Station.
- CP.** Electrical Requirements for Firing Rockets by Induction. J. P. McClellan, U. S. Naval Ordnance Test Station.
- CP.** Determination of the Composition of Surface Layers by Ion Scattering. Sylvan Rubin, A. M. Zarem, V. K. Rasmussen, Stanford Research Institute.

2:00 p.m.—Metal Industry

- CP.** The Rising Tide of Business and Industry on the Pacific Slope. Alden G. Roach, Columbia Steel Co.
- 50-185. Electrical Problems of the Steel Plant at Fontana. George ACO.* Scheer, Kaiser Engineers.
- CP.** Features of Electric Arc Furnaces. C. C. Brandt, Bethlehem Pacific Coast Steel Corp.
- CP.** Electrical Aspects of Joining Large Diameter Pipe. H. E. Parks, Consolidated Western Steel Corp.
- CP.** The Aluminum Industry in the West. F. J. Wood, Permanente Metals.



Turbine Room, Harbor Steam Plant
Department of Water and Power, City of Los Angeles

Thursday, June 15

9:30 a.m.—Instruments and Measurements

- CP.** An Electromagnetic Method of Measuring Oscillating Fluid Flow. A. J. Morris, Office of Naval Research; J. H. Chadwick, Stanford University.
- CP.** A Recording Power Frequency Meter Reasonably Independent of Operating Voltage. N. M. Albert, Pacific Gas and Electric Co.
- CP.** Front-of-Wave Impulse Measurement Techniques. M. M. Newman, Peter Bellaschi, University of Minnesota.
- 50-155. Indicating Instruments at the Servomechanism Frequencies. W. S. Pritchett, R. M. Saunders, University of California.
- CP.** A Review of Instruments and Practices for Insulation Resistance Measurements. W. G. Foster, Portland General Electric Company.

9:30 a.m.—Microwave Applications

- 50-151. Field Testing a Microwave Channel for Voice Communication, Relaying, Telemetry and Supervisory Control. D. R. Pattison, Pennsylvania Electric Co. M. E. Reagan, S. C. Leyland, F. B. Gunter, Westinghouse Electric Corp.
- 50-170. Microwave Applications to Bonneville Power Administration System. R. F. Stevens, T. W. Stringfield, Bonneville Power Administration.
- 50-171. Microwave Systems for 960 and 2000 Megacycles. R. V. Rector, General Electric Co.; W. E. Sutter, International General Electric Co.
- CP.** 940 to 960 Megacycle Communication Equipment for Industrial Applications. F. B. Gunter, Westinghouse Electric Corp.
- CP.** Problems to be Solved in the Application of Microwave Equipment. R. C. Cheek, Westinghouse Electric Corp.

9:30 a.m.—Protective Devices

- 50-152. Proposed Basic Impulse Insulation Levels for High Voltage Systems. J. E. Clem, J. R. Meador, W. J. Rudge, A. H. Powell, General Electric Company.
- 50-150. Evaluation of Arrester Lead Length and Separation in Coordinated Protection of Apparatus Against Lightning. T. J. Carpenter, I. B. Johnson, L. E. Saline, General Electric Co.

Digests of most papers will appear in **ELECTRICAL ENGINEERING**

- 50-153. Coordination of Arrester Location with Transformer Insulation Level. R. L. Witzke, T. J. Bliss, Westinghouse Electric Corp.
- 50-147. Protection of Rotating Machines Against Lightning Surges—ACO.* Insulation Coordination Requirements and Protective Measures. P. L. Bellaschi, Portland, Oregon.

9:30 a.m.—System Planning

- 50-139. Expansion of the Electric Systems in the Pacific Southwest. ACO.* H. A. Lott, Southern California Edison Co.
- 50-144. Power System Planning in the City of Los Angeles. A. L. Williams, E. L. Kanouse, Dept. of Water and Power, The City of Los Angeles.
- 50-138. Expansion of the System of the Southern California Edison Company. A. A. Kroneberg, Southern California Edison Co.
- 50-132. System Planning in Northern and Central California. I. W. ACO.* Collins, Pacific Gas and Electric Co.
- CP.** A Half Century of Power Resources Planning. G. H. Groh, Harry Wells, Central Arizona Light and Power Co.
- 50-172. A Simple New Resistance Type A-C Load Flow Board is Built and Operated by the Portland General Electric Company. W. E. Enns, Portland General Electric Co.
- 50-173. Application of Calculated Risk to Oil Circuit Breaker Modernization Program. M. J. Lantz, Bonneville Power Administration.

9:30 a.m.—Student Technical Session

2:00 p.m.—Instruments and Measurements

- 50-160. Principles of Design of Log-Scale D-C Indicating Instruments. Allen Stimson, C. F. Taylor, General Electric Co.
- CP.** Output Analysis and Alignment Techniques for Phase-Rotation Single Sideband Transmitters. Oliver Whitby, D. R. Scheuch, Stanford Research Inst.
- CP.** Electrical Measurement of Microsecond-Duration Dynamic Strains. L. A. Roberts, Palo Alto, California.
- CP.** Operation of Electrodynamometer Instruments Through Amplifiers. W. G. Hoover, Stanford University.
- 50-183. Use of High-Pressure Mercury Arc Lamps for Pulsed Light Applications. R. O. Briggs, F. W. Looschen, S. F. Schmidt, Ames Aeronautical Lab.
- CP.** Present Status and Applications of Microwave Spectroscopy. W. D. Hershberger, University of California.

2:00 p.m.—Conference on Carrier Current

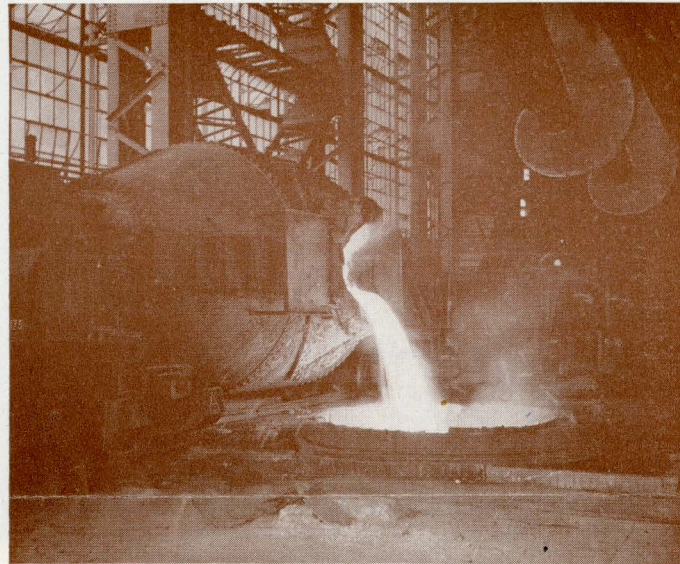
- 50-162. A Low Noise and Distortion Audio Multiplexing Equipment with High Stability Carrier Supply. F. S. Beale, Westinghouse Electric Corp.
- CP.** Integrated Power Line Carrier System. H. S. Lane, Pacific Gas and Electric Co.
- CP.** Measurements and Tests on Power Line Relaying System. R. H. Miller, Pacific Gas and Electric Co.
- CP.** Methods of Trap Tuning. C. R. Canady, Southern California Edison Co.
- 49-211. Modern Carrier Current Test Equipment and Its Application. R. L. Brinton, Pacific Gas and Electric Co. Presentation by title only.

2:00 p.m.—Conference on Protective Devices

- 49-280. Application Guide on Methods of Neutral Grounding of ACO.* Transmission Systems. Working Group of Subcommittee on Fault Limiting Devices.
- 49-281. Application Guide for the Grounding of Synchronous Generator Systems. Working Group of Subcommittee on Fault Limiting Devices.
- 49-283. Guide for Application of Ground-Fault Neutralizers. Working ACO.* Group of Subcommittee on Fault Limiting Devices.
- 50-154. Development of the Standard for Neutral Grounding Devices. J. E. Clem, General Electric Co.
- 49-284. Report on Survey of Unbalanced Charging Currents on Transmission Lines as Affecting Ground-Fault Neutralizers. Working Group of Subcommittee on Fault Limiting Devices.

2:00 p.m.—District Branch Prize Papers

Presentation of District Branch Prize Papers by the winners from the even-numbered Districts Nos. 2, 4, 6, 8, and 10.



Kaiser Steel Corp., Fontana, Calif.

Friday, June 16

9:30 a.m.—Hydroelectric Systems

- 50-136. The Bridge River Hydro Electric Development. T. Ingeldow, J. H. Steede, British Columbia Electric Railway Co., Ltd.
- 50-186. Underground Hydro-Electric Power Plants. P. E. Gisiger, Sao Paulo Tramway Light and Power Co.
- 50-149. Underground Hydro-Electric Power Stations in Sweden. Ake Rusck, G. Westerberg, Swedish State Power Board.
- 50-188. The Determination and Allocation of the Capacity Benefits Resulting from Interconnecting Two or More Generating Systems. C. W. Watchorn, Pennsylvania Water and Power Co. Presentation by title only.

9:30 a.m.—Symposium on the Bevatron

- CP.** Pulsed Power Particle Accelerators. George Farley, University of California.
- CP.** Multi-purpose Generators and Controls for High Energy Particle Accelerators. G. L. Godwin, L. A. Kilgore, Westinghouse Electric Corp.
- 50-174. Ignitron Converters for High Energy Particle Accelerators. J. L. Boyer, C. R. Marcum, Westinghouse Electric Corp.
- CP.** Design and Preliminary Operation of the Bevatron with Emphasis on the Magnetic Circuit. Duane Sewell, University of California.
- CP.** Frequency Control for the Bevatron R. F. Voltage. Jack Reidel, University of California.

9:30 a.m.—Substations

- 50-142. A 5000 Kva Underground Substation. J. F. Sinnott, San Diego Gas and Electric Co.
- 50-131. Automatic Control of Ignitron Rectifier Stations. E. J. Cham, W. A. Derr, Westinghouse Electric Corp.
- 50-175. Multi-Station Supervisory Control, Telemetering and Communication on Single Frequency Carrier Channel. W. A. Derr, Westinghouse Electric Corp.; T. C. Wren, Sierra Pacific Power Co.; J. V. Kresser, Westinghouse Electric Corp.
- CP.** System-Wide Fast Response Telemetering. G. W. Dupree, Southwestern Public Service Co.
- CP.** Use of Ultrahigh-Frequency Equipment for Supervisory Control and Telemetering. L. E. Ludekens, Southern California Edison Co., Ltd.

9:30 a.m.—Lumber and Paper Mills

- 50-176. Amplidyne-Controlled Log Carriage Drive. W. D. Vincent, General Electric Co.
- CP.** Electrification of a Pulp Mill and Board Machine. J. A. Tudor, Westinghouse Electric Corp.
- CP.** Electric Equipment for Paper Mill Winders. Subcommittee on Pulp and Paper Industry. Presentation by F. M. Dorey.
- CP.** Electric Equipment for Paper Mill Supercalenders. Subcommittee on Pulp and Paper Industry. Presentation by H. A. Rose.

9:30 a.m.—Student Technical Session

2:00 p.m.—Excitation Systems

- 50-137. Hydroelectric Generator Excitation Experience at Grand Coulee. C. L. Killgore, N. G. Holmdahl, Bureau of Reclamation.
- CP.** Parallel Operation of Main Exciter Rototrol and Conventional D-C Exciter. J. E. Barkle, C. E. Valentine, A. M. Harrison, Westinghouse Electric Corp.
- CP.** A Commutatorless Pilot Exciter for Turbine Generators. C. Lynn, Westinghouse Electric Corp.
- 50-187. Centralized Control Desirable for Single Boiler-Turbine-Generator Units. J. A. Lind, J. M. Geiger, Buffalo Niagara Electric Corp. Presentation by title only.

2:00 p.m.—Magnetic Amplifiers and Transformers

- 50-159. The Design of Broadband Transformers for Linear Electronic Circuits. H. W. Lord, General Electric Research Laboratory.
- 50-148. General Characteristics of Magnetic Amplifiers. L. A. Finzi, D. C. Beaumariage, Carnegie Institute of Technology.
- 50-177. Response Time of Magnetic Amplifiers. E. L. Harder, W. F. Horton, Westinghouse Electric Corp.
- 50-156. The Extension of Amplistat Performance by Alternating Current Components. R. E. Morgan, H. M. Ogle, V. J. Wattenberger, General Electric Co.
- CP.** Theory of the No Load Characteristics of Highly Saturable Reactors with Hysteresis. Alfredo Baños, Jr., University of California.

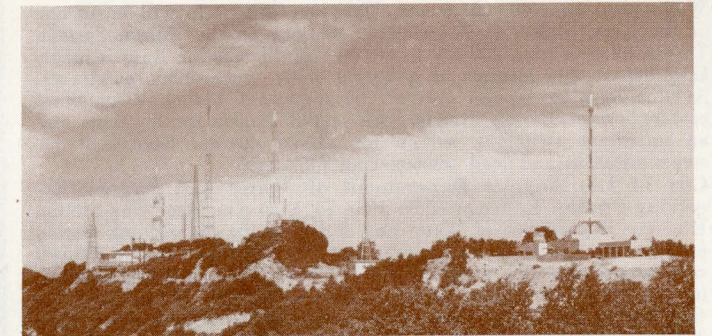
2:00 p.m.—Electronic Power Converters

- 50-145. High Voltage Rectifier Equipment and Control for Tube Testing. S. R. Durand, Allis-Chalmers Manufacturing Co.
- 50-146. High-Voltage Ignitron Rectifiers. M. J. Mulhern, General Electric Co.
- 50-157. Ignitron Pulse Equipment for Particle Accelerators. C. C. Herskind, J. E. Hudson, General Electric Co.
- CP.** A Brief Pictorial Story on the Early Development of the Mercury Arc Rectifier. W. C. White, General Electric Co.
- CP.** Survey of Operation of Mercury Arc Rectifiers. Committee on Electronic Power Converters.
- 50-133. Protection of Electronic Power Converters. Committee on Electronic Power Converters. Presentation by title only.
- 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.

INSPECTION TRIPS:

Lockheed Aircraft Corporation, Burbank, California. Monday, June 12, 2:00 p.m. At this plant, home of the famous P-38 Interceptor, F-80 Jet Fighter, P-2V Truculent Turtle, and Constellation Transport Planes, it will be possible to see extensive plant facilities, production methods and planes in current production. It is necessary that the total group be limited to 90 persons all of whom must be citizens of the United States.

Walt Disney Studios. Monday, June 12, 2:00 p.m. Wednesday, June 14, and Friday, June 16, 1:30 p.m. At this studio in Burbank the Silly



Mount Wilson Television Stations

Symphonies, Donald Duck and other short subjects are produced, as well as full length feature pictures such as: Snow White and the Seven Dwarfs, Pinocchio, Dumbo, Fantasia, Cinderella, and others. For the convenience of guides and visitors, parties must be limited to groups of 15 to 20 persons, with staggered starting time approximately 15 minutes apart. Four such parties can be handled in one afternoon. Visitors will be shown how the studio operates in approximately the following sequence: (1) development of a story by means of a pictorial script. (2) development of new characters and standardization of their gestures and appearance. (3) production, inking, painting of background and action cells. (4) paint laboratory where careful spectrophotometric control of paint manufacture is maintained. (5) the multiplane cameras (these will be of considerable technical interest as they are a unique Disney development). (6) the cutting and editing of motion pictures. (7) sound recording stages and equipment for live action, sound effects, and orchestration. (8) the general plant facilities comprising the electric sub-station and distribution system, steam plant, and air conditioning system. (9) the review theatre and its technical features (a short subject in current production may be screened for the entire group).

Southern California Edison Company's Redondo Steam Station. Tuesday, June 13, 8:30 a.m. Southern California Edison Company's new Redondo Beach steam-electric generating station was completed October 10, 1949, when the fourth generating unit was put on the line. Built at a cost of \$38,300,000 the station has a capacity of 280,000 kilowatts.

The Redondo Beach plant is one of the most efficient and modern steam-electric generating stations in the world, and is noted for its many unique features and technical innovations. Ocean water, used in vast quantities for cooling purposes, is pumped to and from the station through two submarine tunnels extending 1,900 feet into the sea along the ocean bottom. To prevent the accumulation of troublesome marine growths in undersea conduits, the direction of flow in the tunnels is periodically alternated. Continuing the trip the next stop will be at the **City of Los Angeles Department of Water and Power, Harbor Steam Plant** where box lunches will be served. This steam plant, the largest municipally owned steam plant in the United States, has a total rated capacity of 350,000 KW. The first of two units at this plant were designed as quick pickup units to provide stand-by capacity for hydro-electric generation. Each of these units consists of a 65,000 KW, 0.8 PF, 3600 RPM tandem compound turbine, directly connected to an 81,250 KVA, 60 cycle, 3 phase, 13,800 volt hydrogen cooled generator. Steam is supplied at a nominal pressure of 850 psi, 900° F. Units 3, 4, and 5 are rated at 75,000 KW, 0.8 PF, 1800 RPM, single cylinder turbine, directly connected to 93,750 KVA, 60 cycle, 3 phase, 13,800 volt hydrogen cooled generators. The Harbor Steam Plant is designed on the unit system, that is a single boiler furnishes steam to one turbine. This plant, located in the vicinity of the Los Angeles Harbor, uses sea water in the steam condensers.

California Institute of Technology. Wednesday, June 14, 9:30 a.m. The nearness of this outstanding technical school and research institute affords unusual opportunity for AIEE visitors to visit the Cal Tech Campus, as well as other activities not on campus operated by the Institute. A tour of the campus will include visits to Astrophysics Departments, where special exhibits on the Palomar and Mount Wilson Observatories have been set up, to the Analog Computer and I.B.M. Digital Computer in the Electrical Engineering Department, a demonstration of high voltage and dielectric investigation in the High Voltage Laboratory, a demonstration of high-velocity water tunnel, and the hydro-dynamic model testing in the Hydro-dynamics Laboratory.

AIEE Summer and Pacific General Meeting

Southern California Edison Company Mesa Sub-Station. Wednesday, June 14, 10:00 a.m. This inspection trip will be to one of the latest high voltage switching stations on the Edison System. Transformation from 220 KV to 66,000 volt distribution lines is made. Installed at this location is a 60,000 KVA synchronous condenser. At this location is also one of the important branch dispatching centers for the Edison System. This station is also the terminus and an important switching station for carrier current equipment for communication and load telemetering purposes.

City of Los Angeles Department of Water and Power—Receiving Station E. Wednesday, June 14, 1:30 p.m. Receiving Station E of the Department of Water and Power is the dispatching station for the San Fernando Valley area and the terminus for one 287,000 volt transmission line from the Hoover Power Plant and the terminus for the 110 kv lines from the aqueduct power plants #1 and #2. At this station the Hoover transmission voltage is stepped down from 287 kv to 132 kv by a 195,000-kva transformer bank. One 60,000-kva synchronous condenser is used for voltage control. Two 60,000 kva transformer banks are used to step down from 132 kv to the sub-transmission voltage of 34.5 kv. There are two 34.5 kv switchracks, each having 13 positions, one of which feeds the municipalities of Burbank and Glendale with their allocation of Hoover power, and the other supplies the various distribution stations of the Department of Water and Power in the San Fernando Valley Area. This station will also serve as the terminus for the 220 kv Owens Gorge line now under construction.

University of California, Los Angeles Campus. Wednesday, June 14, 1:30 p.m. This University is expanding more rapidly than any other on the West Coast and because of the extent of research activities, the outstanding architecture of its buildings and spaciousness of its campus should not be missed by visitors to the AIEE Meeting. Recently established schools of medicine, law and engineering are growing rapidly. Among other new buildings to be seen are the newly completed engineering building, which houses Chemical, Petroleum, Fluid Mechanics, Oil Mechanics and Ceramics. A second new Engineering Building is under construction and this will house Aeronautical Engineering. At this University is an outstanding computing analyzer and a differential analyzer. Other interesting equipment is the Engineering Department is an electron microscope and an Army Ordnance Gage Laboratory.

Mount Wilson Observatory and Television Stations. Wednesday, June 14, 7:00 p.m. An early evening trip will be made to this world renowned observatory, located on Mount Wilson above Pasadena. A visit to the 100" telescope, and to the Astrophysics Museum will be included, as well as other observatory facilities. A description will be given of the work carried on at this observatory as well as some of the separate and inter-related activities at the Palomar Observatory. Nearby is located the Pacific Telephone and Telegraph Terminal Station for the Mount Wilson-Hollywood Microwave Radio Relay System, which transmits television programs from their Hollywood Central Office to Mount Wilson. From this building parts of television programs are carried by cable to various broadcasting stations. There are seven television stations located on the mountain top, six of them currently broadcasting from this location. Inspection of some of these facilities will be possible.

Pacific Telephone and Telegraph Company, Los Angeles Communication Center. Thursday, June 15, 9:30 a.m. A tour through the two large downtown Los Angeles buildings of Pacific Telephone affords an opportunity for members to see in operation Southern California's largest communications center. In these two buildings you will see the following: (1) The terminal of the coaxial cable from the east. (2) The terminal for the Los Angeles-San Francisco microwave radio relay system. (3) The television service center. (4) Facilities for local exchange telephone service. (5) Equipment and switchboards for originating, terminating and "through" long distance telephone traffic. (6) A crossbar tandem switching office. (7) Information and intercepting switchboards. (8) Facilities for providing and monitoring radio program network service. (9) An audichron that automatically provides continuous time-of-day service. (10) Facilities for telegraph and leased wire service. (11) A switching center for teletypewriter exchange service. (12) Facilities and switchboard positions for mobile and ship telephone service. (13) Terminal for Los Angeles-Catalina Island radio relay system. (14) A modern test center.

Kaiser Steel Corporation, Fontana Works. Thursday, June 15, 1:30 p.m. Located at Fontana, California, adjacent to the City of San Bernardino on a 1,300 acre site, this plant is a fully integrated steel mill, the first of its type on the Pacific Coast. It is the only steel mill on the coast with its own coke ovens and blast furnaces as well as open hearth furnaces and steel finishing facilities. In addition to



J. E. Ostline at Sunland-Tujunga Telephone Co.

pig iron and coke oven by-products, it produces semi-finished and finished steels as follows: Plate, large and small structural shapes, continuous weld pipe, hot and cold rolled strip, skelp, carbon and alloy bars, and foundry products. A complete tour of this plant by AIEE visitors should be one of the industrial highlights of the Summer Meeting.

KFI-TV Television Studio. Thursday, June 15, 1:30 p.m. This inspection trip to the studios of Station KFI-TV will not only include a complete inspection of the studio, associated control room and other equipment, but also participation in a day-time television program.

Palomar Observatory. Friday, June 16, 8:30 a.m. In order to see this world renowned project a special all-day trip has been arranged. The total round-trip distance from Pasadena by bus is 260 miles, and it is suggested that the trip only be undertaken by those who will suffer no ill effects from the time and distance involved in such long rides. The coastal and mountain scenery will be most interesting. The opportunity to visit the 200" telescope to see it in operation, as well as the other smaller telescopes, and the Schmidt Telescope will make the trip more than worthwhile for those who go.

Sunland-Tujunga Telephone Company. Friday, June 16, 1:30 p.m. In this telephone exchange (Florida) is one of the first and most complete installations of Automatic Toll Ticketing and Automatic Toll Accounting procedures. Through this exchange approximately 6,000 local service subscribers have access by direct dialing to 1,250,000 telephones in the Los Angeles Metropolitan Area. The dialing operation is all that is necessary for calls to be made and completely recorded so that toll charges can be billed at the end of the billing period, without switchboard personnel typists or adding machine operators. No development in automatic telephone switching during the last ten or fifteen years has stirred the interest of telephone engineers and operating executives as much as that which can be demonstrated at this modern independent exchange.

Issued by
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS
33 West 39th Street, New York 18, N. Y.

PRINTED IN U.S.A.