ACCOMPLISHMENTS

of the

AMERICAN INSTITUTE

of

ELECTRICAL ENGINEERS

in the

ENGINEERING WORLD

1943

Membership Committee

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

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1943

FOREWORD

When the Membership Committee undertook the preparation of this material concerning the American Institute of Electrical Engineers, it found that various engineers had quite different ideas about the relative importance of the varied and sundry Institute activities. Some stressed the work done by the technical committees toward stimulating and coordinating improvements in knowledge and processes. Others believed the collecting and publishing of new information represented the chief contribution. Still others looked on technical meetings and educational courses as the means of greatest influence. There was general agreement that the Institute offered exceptional opportunities for electrical engineers to discuss problems and seek their solution in an atmosphere of mutual understanding and sympathetic fellowship.

It is evident that the Institute has many sides. To understand them all would require not only much time and study but also years of participation in its work. Herein, an effort will be made to sketch, for the present members and for the young men entering the profession, some of the phases which have resulted in the Institute forging ahead to its present position as one of the leading influences in the field of engineering. Looking ahead, the methods of procedure may be modified by developments to come, but the opportunity for participation in professional work will exist as long as human beings have the capacity for initiating changes in the interest of advancement of civilization.

In the following pages there will be told as briefly and directly as possible:

(a) Why there is an American Institute of Electrical Engineers.

(b) How the Institute is organized; how it functions; where its members are located throughout the United States and in other countries.

(c) Some representative accomplishments and contributions which the Institute has made, through the efforts of many of its members, to society as a whole.

(d) How the Institute is joining with other technical organizations for worthwhile, but little publicized, cooperative effort which has for its aim the steady advancement of the engineering profession generally.

CONTENTS

WHY THERE IS AN INSTITUTE

In 1884 a small group of the leading electrical thinkers and experimenters joined together and formed the American Institute of Electrical Engineers. This organization has since functioned continuously, as stated in the present Constitution for "the advancement of the theory and practise of electrical engineering and of the allied arts and sciences, and the maintenance of a high professional standing among its members."

It is natural that persons interested in the same technical problems should be encouraged to meet and to compare experiences, theories, and conclusions. By this means fresh ideas are evolved, men encourage each other, and the stimulus is cumulative. Today the American Institute of Electrical Engineers represents the wide-spread interests of engineers in the whole field of electrical engineering, defining their contributions and unifying their efforts in professional work.

Engineering, in its broadest aspect, is a profession based on specialized technical knowledge. The electrical engineer, like other engineers, combines his own ideas and experience with those of his associates in order that all may share in the progress of technical knowledge. Contributions of all technical and professional men are totalized through our industrial and governmental institutions to make a civilization which is more closely identified with technical developments than with any other single factor.

The American Institute of Electrical Engineers has become the association through which the specialized knowledge of the electrical profession reaches out to all parts of the industrial system.

Organization of the Institute

The many and varied activities of the Institute, except for a small but highly skilled Headquarters Staff, are carried on through the voluntary efforts of elected officers and appointed members of the various committees. The accompanying chart (in the exact center of this booklet) will facilitate gaining a clear picture of the (1) National (2) District (3) Section and (4) Student Branch organizations. The 17 General, 5 Special and 19 Technical Committees constitute the elements through which the main directives are set in motion. In addition there are many other temporary groups, such as convention committees, which are set up and function for a limited time then pass out of existence after their assignments are completed.

It is estimated that some 2000 members take part each year in furthering the progress of the electrical profession within the framework of the Institute. Thus one member in every ten has some place in its operation during any specific year, either in an office or on a committee of national, district, or section activities. The members are encouraged to take an active part in some phase of Institute work.

Extent of the Institute

The principal membership of the American Institute of Electrical Engineers is, of course, in the United States and Canada. However, a great many electrical engineers of other countries have affiliated with us and their membership is highly valued. Steps have recently been taken which will soon permit a considerable increase in cooperation with Latin American and South American electrical engineers by the formation of additional sections of the Institute in these regions.

The following information will be helpful in visualizing the size of the Institute and the geographical distribution of the more than 20,000 members (excluding Enrolled Students). There are at present ten geographical Districts each headed by a Vice President. Each District is subdivided into Sections which constitute the media through which the Institute functions as a vital living force for the benefit of its members. There are 74 Sections and others will be formed as time goes on in localities where a sufficient number of members reside to carry on a well balanced program of activities.

In addition to the established Sections, several subsections have been formed, especially in the South and Middle West where distance is a barrier to full participation in Section affairs. In some instances these subsections will ultimately develop into full Sections as their work gains momentum.

DISTRIBUTION OF AIEE MEMBERSHIP

As of August 1, 1943

DISTRICT 1 — MEMBERSHIP 2,872

NORTH EASTERN

TERRITORY

Connecticut, Maine, Massachusetts, New Hampshire, New York (Exclusive of New York Section Territory), Rhode Island, Vermont

SECTIONS

Boston	Niagara Frontier	Schenectady
Connecticut	Pittsfield	Springfield
Ithaca	Providence	Syracuse
Lynn	Rochester	Worcester

DISTRICT 2 — MEMBERSHIP 4,352

MIDDLE EASTERN

TERRITORY

Delaware, District of Columbia, Maryland, New Jersey (Exclusive of New York Section Territory), Ohio, Pennsylvania, W. Virginia

SECTIONS

Akron	Erie	Pittsburgh
Cincinnati	Lehigh Valley	Sharon
Cleveland	Mansfield	Toledo
Columbus	Maryland	Washington, D. C.
Dayton	Philadelphia	W. Virginia

DISTRICT 3 — MEMBERSHIP 5,114

NEW YORK CITY

TERRITORY

Territory of New York Section, Canal Zone, Porto Rico, All Foreign Countries (Canada Excepted)

SECTIONS

New York	Mexico

DISTRICT 4 — MEMBERSHIP 1,256

SOUTHERN

TERRITORY

Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, N. Carolina, S. Carolina, Tennessee, Virginia

SECTIONS

Alabama	Louisville	N. Carolina
E. Tennessee	Memphis	S. Carolina
Florida	Muscle Schoals	Virginia
Georgia	New Orleans	

DISTRICT 5 — MEMBERSHIP 2,398

GREAT LAKES

TERRITORY

Illinois, Indiana, Iowa, Michigan, Minnesota, Wisconsin

SECTIONS

Central Indiana	Iowa	Minnesota
Chicago	Madison	South Bend
Fort Wayne	Michigan	Urbana
	Milwaukee	

DISTRICT 6 — MEMBERSHIP 267

NORTH CENTRAL

TERRITORY

Colorado, Nebraska, N. Dakota, S. Dakota, Wyoming

SECTIONS

Denver — Nebraska

DISTRICT 7 — MEMBERSHIP 1,253

SOUTH WEST

TERRITORY

Arkansas, Kansas, Missouri, New Mexico, Oklahoma, Texas

SECTIONS

Houston	N. Texas	S. Texas
Kansas City	Oklahoma City	Tulsa
N. Mexico-W. Texas	St. Louis	Wichita

DISTRICT 8 — MEMBERSHIP 1,382

PACIFIC

TERRITORY

Arizona, California, Nevada, Hawaii, Philippines

SECTIONS

Arizona	Los Angeles	San Francisco
	San Diego	

DISTRICT 9 — MEMBERSHIP 712

NORTH WEST

TERRITORY

Idaho, Montana, Oregon, Utah, Washington, Alaska

SECTIONS

Montana	Seattle	Utah
Portland	Spokane	

DISTRICT 10 — MEMBERSHIP 787

CANADA

SECTIONS

Midwestern Canada	Montreal	Vancouver
	Toronto	

TOTAL MEMBERSHIP AS OF AUGUST 1, 1943 20,393

The Student Electrical Engineer

For many years the Institute has recognized the desire on the part of electrical engineering students to become affiliated with it early in their careers, by maintaining Student Branches in the leading technical colleges and universities of the United States and Canada. Active branches number 125 at present and well over 5000 students participate in this activity. The monthly publication ELECTRICAL ENGINEERING is made available to each Enrolled Student and the Branches hold numerous technical meetings each year which are arranged by the students themselves through their own organizational processes. The Institute takes a great deal of pride in the splendid work being done in the several Branches.

Student Branches of the Institute are to be found in all of the institutions offering Electrical Engineering curricula which has been accredited by the Engineers' Council for Professional Development.

Opportunities Through Institute Meetings

As indicated previously, Sections exist wherever a sufficient number of members are available. The individual section meetings are planned by the local members, and the programs are designed to satisfy the needs of members in their professional engineering lives. In the Section, each member has an opportunity to serve, an opportunity to contribute, or an opportunity to learn from others. He can meet his fellow engineers in technical and social gatherings, or in any educational courses and inspection trips which the members develop for their mutual benefit.

Each District and Section develops its own program to fit its requirements, its size, or its opportunities. Technical presentations form the backbone of the meetings. Speakers on general engineering topics are frequently brought in to broaden the general outlook.

Round table discussions, in which interested engineers participate, provide a means of exchanging information on a chosen subject in an informal and constructive way, and have been generally successful in developing full participation of interested members.

Inspection trips have been organized to permit members to survey many important industrial operations, utilizing numbers to reduce transportation expenses. Trips have been made to large steel mills, electrical manufacturing plants of many types, lamp and tube factories, aircraft plants, engine factories, power stations, broadcasting studios, cyclotrons, mercury-turbine plants, laboratories, naval vessels, ship yards, vehicular tunnels, planetariums, museums, and bridges during construction stages, to name a few by way of illustration.

The National Technical Meetings are, of course, highlights for those engineers able to attend them. The Winter Meeting is held each year in New York or Philadelphia; the Summer Meeting is held annually and is

rotated throughout Eastern United States and Eastern Canada; the Pacific Coast Meeting is held annually at an appropriate location in Western United States or Western Canada. District Meetings provide a way by which practically all the membership can, at reasonable expense, take part in some of these activities. Section Meetings and in some of the larger Sections, Group Meetings provide opportunities for every member to join in the consideration and discussion of timely technical subjects.

Educational Opportunities Provided By the Institute

Young engineers are advised to continuously study the professional field in which they work, and the jobs in which they are engaged. By his membership in the AIEE, many an electrical engineer has increased his professional knowledge and standing.

All readers of the publication ELECTRICAL ENGINEERING, whether young or seasoned engineers, will recall many articles dealing with underlying principles of the science of electricity. Such presentations have featured the results of the latest thinking on fundamental facts and have served as a means of reeducation for members who otherwise may have lost contact with educational institutions, research findings, or the direct stimulus of personal meetings with fellow engineers.

Many of the larger sections have the advantage of numbers concentrated in a metropolitan area and have utilized this fact to establish technical study courses, at a moderate additional cost to those participating. Some have been operated in order that members can better qualify for State Professional Engineers' Licenses, with carefully prepared review courses in *Structural Planning and Design,* or *Electrical Engineering. Elementary and Advanced Effective Speaking* courses have been operated for self-improvement in a necessary field.

Other programs have been planned to increase the engineer's knowledge in a specialized field. The following, all consisting of a series of from 4 to 20 lectures, have been provided at various times:

Electronics
Frequency Modulation
Wave Filters and Other Networks in Theory and Practice
Ultra-High Frequency
Modern Methods for Communication Measurements
Electrical Phenomena in Bio-Physics
Power Transmission & Distribution including Relaying & Symmetrical Components
Industrial Control Equipment
Advanced Methods of Mathematical Analysis
DC Motors and Generators
Advanced Transmission Design
Military Science & Engineering
Metals in Industry

The Relation Between Electrical Engineers and All Professional Engineers

Electricity is applied in so many diversified ways today that it carries professional activities outside of the electrical engineering field. The Institute, therefore, shares in studying and preparing material for other organizations through its membership representation on 35 committees, associations, and societies which are concerned with the entire engineering field.

Every electrical engineer in the Institute has, through his representatives on these boards, had available to him a voice in the activities which interest him. The work and progress of these groups is reported to him through the pages of ELECTRICAL ENGINEERING.

Standards

In an age of standardization, the electrical representatives to the American Standards Association have an important effect on future electrical work.

Organized in 1918 by the AIEE and four other societies, The American Standards Association serves as a national clearing house for engineering and industrial standardization and provides information on such standardization. The control of this work rests with the organization whose representatives make up the Association. Its primary purpose is to insure adequate procedure in establishing standards and rules that must be observed by its cooperating groups in order that the approval of the Association may be given. There are 41 member bodies and 31 associate member bodies in the Association. They are continually reviewing, considering, and approving standards as well as initiating new projects.

Research

Research in science and engineering and the general advancement of the profession of engineering is carried on through the Engineering Foundation. It was founded in 1914 by Ambrose Swasey as an endowment fund. It has a Board of 16 members representing all of the Founder Societies and the United Engineering Trustees, Inc. The funds are held and managed by the United Engineering Trustees, Inc.

The Engineering Foundation has aided in establishing and promoting the National Research Council. It has aided in numerous special researches concerning irrigation, flood control, welding, power developments, mining problems and so on. It issued RESEARCH NARRATIVES from January 1921, to December 1932. Requests for useful work far exceed present resources.

Science

The American Association for the Advancement of Science carries on a program designed to advance physical, biological, social, pure and applied science. It sponsors research and publishes the SCIENTIFIC WEEKLY and the SCIENTIFIC MONTHLY. It also publishes technical and non-technical books. Forty-eight state academies and other scientific organizations cooperate actively with the Association.

Technical Cooperation

Information on corrosion problems is cleared through the American Coordinating Committee on Corrosion formed in 1939 under the auspices of the American Society for Testing Materials.

Similarly, grounding questions are resolved through the American Research Committees on Grounding. Its membership includes the organizations interested in the use of water pipes for electrical grounding such as power, gas, and communication companies, water and transportation associations as well as copper, brass and sanitary groups. The chief objective of the Committee is to determine the effect of grounding electrical circuits to water pipes. The Committee actually checks field conditions to gather pertinent data. A report of this Committee appeared in the Edison Electric Institute Bulletin of August 1942.

Other committees, such as the American Committee on the Marking of Obstructions to Air Navigation, deal with special problems as they arise.

Library

The Library Board of the United Engineering Trustees, Inc., consists of 21 members: each Founder Society has 3 members; 4 members are appointed by the trustees; the Director of the Library; and each Founder Society secretary. This Board manages the Engineering Societies Library. It endeavors to keep the library up to date and make its special services available to all members.

United Engineering Trustees, Inc.

The United Engineering Trustees, Inc., is a corporation founded by the four Founder Societies. It is the titular owner of the Engineering Societies Building, the Engineering Societies Library, and trust funds for the library, the Engineering Foundation, the John Fitz Medal Award, and the Daniel Guggenheim Award. It also acts as treasurer for Engineers' Council for Professional Development. Corporate powers are invested in a Board of twelve trustees equally chosen from the four Founder Societies.

Engineers' Council for Professional Development

The underlying purpose of the Engineers' Council for Professional Development is to improve the training and selection of men who enter the profession, to develop those within the profession, especially the junior members, and to secure the proper recognition of the engineering profession. The work is principally carried on by four committees (a) student selection and guidance (b) engineering schools (c) professional training and (d) professional recognition. A pamphlet "Engineering as a Career" published in 1942 and available from Headquarters at ten cents per copy is an example of the work of one of the committees which should help the Engineer in the discharge of his community responsibilities. The Committee on Engineering Schools published (see ELECTRICAL ENGINEERING December 1941) the accredited curricula for engineering schools and is always busy examining and reexamining the standards maintained. In

June 1941, a joint meeting with the American Society of Mechanical Engineers was held in Kansas City to study, discuss, evaluate and, if possible improve the methods for professional training of engineering juniors. This report emphasizes the need for personal contact between "age groups" and quotes the success of those who have taken this obligation seriously.

Electrical Engineers and Public Service

The Institute is vitally interested in taking an active interest in public affairs. The Board of Directors has authorized and organized several committees and groups to assist the National effort. At the present time World War II and its probable aftermath commands first consideration of all electrical engineers. The September 1943 issue of ELECTRICAL ENGINEERING carries a news item (p. 413) on the "AIEE Wartime Engineering Activities Outlined" which clearly indicates the scope of this work and how it is being carried on.

Public Service Rendered Through the Institute

The Institute has undertaken many activities in connection with the war effort such as (1) cooperation in compiling a census of technical personnel (2) assisting in compiling a census of engineering construction firms (3) aid in locating engineers with special qualifications for war plants and the armed services (4) organizing clinics to deal with war production problems (5) assistance in civil protection problems (6) aid in gathering factual data on the production of critical materials (7) recommending plans for utilizing substitute metals where practicable, such as silver for copper and (8) preparation of emergency standards in the form of guides to assist in obtaining maximum use of existing electrical equipment.

When the full story of World War II can be disclosed, the tremendous part played by electricity in the operation of aircraft, tanks, naval vessels, and other military equipment, will be apparent. At present many electrical applications such as those for communication, plane detection and in war plants must remain secret for obvious reasons.

Electrical engineers, operating through their respective industrial organizations, have utilized the technical background developed by associations made possible by the Institute in pre-war years to render effective service to the nation at war. These same talents, augmented by the extensive advances brought about during the emergency, will be equally productive in the years of peace and reconstruction.

Public Service Rendered Outside of the Institute

Electrical engineers have many opportunities to render valuable service by taking a more active interest in the affairs of government — village, city, state and nation — and by being ready and willing to interpret technical matters to their non-technical associates. By so doing they can contribute to a clearer public understanding of the importance of engineering.

The Institute has recognized the importance of these civic activities on the part of engineers and has supported the organization of local engineering councils, formed by joint action of representatives of the various technical societies in each community. These councils can function to a large degree like the local Bar Association, Medical Association, or Chamber of Commerce and thereby gain for their members increased public recognition as members of a profession rather than simply as technicians.

Specific recommendations for the organization and objectives of these local engineering councils is presented in considerable detail on page 148 of the March 1942 issue of ELECTRICAL ENGINEERING under the heading "Conference Considers Activities for the AIEE during the Emergency."

Many general sessions of the Institute at National, District and Section Meetings have been devoted to, and will continue to be devoted to, the discussion of problems designed to stimulate thought and action on the part of Institute members in taking a more active part in civic affairs.

The Publications

The publications of the Institute contain a running record of the advancements and achievements in the field of electrical engineering. They provide the means for maintaining permanent records for future reference by those who desire to trace the progress in the everchanging realm of the electrical art.

ELECTRICAL ENGINEERING is issued monthly to all Honorary Members, Fellows, Members, Associate Members and Enrolled Students. This magazine has several important sections. Timely articles of general interest appear in the first section. This is followed by a section on Institute Activities including items of interest nationally and sectionally. A section containing matter of Current Interest covers a wide and diversified field. The latter part of the magazine is devoted to the Transactions Section and includes most of the technical papers presented at National Technical Meetings.

THE TRANSACTIONS OF THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS is the permanent record for most of the technical papers presented at National Technical Meetings. Many but not all of these papers have previously been published in the Transactions Section of ELECTRICAL ENGINEERING. In recent years the TRANSACTIONS, published annually, has included some 200 technical papers and nearly as many more have been presented in Institute conferences without formal publication.

The Institute has prepared many STANDARDS covering a wide variety of electrical equipment and other material of a related nature. The bulk of these have been approved by the American Standards Association as American Standards. A list of these standards can be had for the asking from Headquarters.

A I E E
ORGANIZATION
CHART

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

A I E E
ORGANIZATION
CHART

1 - NATIONAL ORGANIZATION

BOARD OF DIRECTORS

PRESIDENT
2 JUNIOR PAST PRESIDENTS
10 VICE PRESIDENTS (DISTRICTS)
12 DIRECTORS
NATIONAL TREASURER

NATIONAL SECRETARY

GENERAL COMMITTEES

CONSTITUTION & BY-LAWS	5
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FORTESQUE FELLOWSHIP	6
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EXECUTIVE COMMITTEE

PRESIDENT
NATIONAL TREASURER
5 MEMBERS OF BOARD OF DIRECTORS

FINANCE COMMITTEE

3 MEMBERS OF BOARD OF DIRECTORS

LOCAL HONORARY SECRETARIES

AUSTRALIA
BRAZIL
ENGLAND
FRANCE
INDIA, NORTHERN
INDIA, SOUTHERN
NEW ZEALAND
SWEDEN
TRANSVAAL, SOUTH AFRICA

BOARD OF EXAMINERS

15 FELLOWS

HEADQUARTERS STAFF

NATIONAL SECRETARY
OFFICE MGR & BUSINESS MGR OF PUBLICATIONS
EDITOR
ASSOCIATE EDITOR
SECY, TECHNICAL PROGRAM COMM
SECY, BOARD OF EXAMINERS & STDS COMM
ADVERTISING MANAGER

GENERAL COUNSEL

CERTIFIED PUBLIC ACCOUNTANTS

INSTITUTE REPRESENTATIVES

ALFRED NOBLE PRIZE COMMITTEE, A S C E	1
AM ASSOC FOR ADV OF SCIENCE, COUNCIL	2
AM COMM ON MARKING OF OBSTRUCTIONS TO AIR NAVIGATION	2
AM COORDINATED COMM ON CORROSION	1
AM RESEARCH COMM ON GROUNDING	1
AM STANDARDS ASSOC, BOARD OF DIRECTORS	1
AM STANDARDS ASSOC, STANDARDS COUNCIL	3
AM YEAR BOOK, ADVISORY BOARD	1
C A COFFIN FELLOWSHIP & RESEARCH FUND COMM	1
CONFERENCE COMMITTEE, JOINT	3
COMM OF APPARATUS MAKERS & USERS, N R C	1
CONSULTATIVE COMM ON ENGINEERING, ADV TO W M C	1
ELECTRICAL STANDARDS COMM, A S A	3
ENGINEERING FOUNDATION BOARD	2
ENGINEERING SOCIETIES MONOGRAPHS COMM	2
ENGINEERING SOCIETIES PERSONNEL SERVICE, INC	1
ENGINEERS' COUNCIL FOR PROFESSIONAL DEVELOPMENT	3
HOOVER MEDAL BOARD OF AWARD	3
INTER-AMERICAN ENGINEERING COOPERATION, JOINT COMMITTEE	1
JOHN FRITZ MEDAL BOARD OF AWARD	4
LIBRARY BOARD, UNITED ENGINEERING TRUSTEES, INC	4
MARSTON MEDAL BOARD OF AWARD	1
NATIONAL BUREAU OF ENGINEERING REGISTRATION, ADV BOARD	1
NATIONAL FIRE PROTECTION ASSOCIATION, ELECTRICAL COMM	1
NATIONAL FIRE WASTE COUNCIL	2
NATIONAL RESEARCH COUNCIL, DIVISION OF ENGG & IND RESEARCH	1
POST WAR PLANNING, JOINT COMMITTEE	1
PRINCIPLES OF ENGINEERING ETHICS, JOINT COMMITTEE	1
QUARTERLY OF APPLIED MATHEMATICS	1
RESEARCH PROCEDURE COMMITTEE, ENGINEERING FOUNDATION	1
UNITED ENGINEERING TRUSTEES, INC	3
U S NATIONAL COMMITTEE OF THE INTERNATIONAL COMMITTEE ON ILLUMINATION	3
U S NATIONAL COMMITTEE OF THE INTERNATIONAL ELECTROTECHNICAL COMMISSION	3
WASHINGTON AWARD COMMISSION	2
WORLD POWER CONFERENCE, EXECUTIVE COMM OF U S NATIONAL COMM	1

NOTE :- FIGURES INDICATE NUMBER OF COMMITTEEMEN

2 - DISTRICT ORGANIZATION

(10 DISTRICTS)

DISTRICT EXECUTIVE COMMITTEE

VICE PRESIDENT (CH)
DISTRICT SECRETARY
DISTRICT VICE CHAIRMAN MEMBERSHIP COMM
SECTION CHAIRMEN
SECTION SECRETARIES
CHAIRMAN, STUDENT ACTIVITIES

COORDINATING COMMITTEE

VICE PRESIDENT (CH)
DISTRICT SECRETARY
4 MEMBERS OF DISTRICT EXEC COMM
1 STUDENT BRANCH COUNSELOR

STUDENT ACTIVITIES COMMITTEE

DISTRICTS
WITH 3 OR MORE STUDENT BRANCHES

A STUDENT BRANCH COUNSELOR (CH)
VICE PRESIDENT
DISTRICT SECRETARY
STUDENT BRANCH COUNSELORS

3 - SECTION ORGANIZATION

(74 SECTIONS)

SECTION EXECUTIVE COMMITTEE

VARY BUT MAY INCLUDE

CHAIRMAN
VICE CHAIRMAN
SECRETARY-TREASURER
MEMBERSHIP COMMITTEE CHAIRMAN
OTHER COMMITTEE CHAIRMEN
MEMBERS-AT-LARGE
GROUP CHAIRMEN
SUB-SECTION CHAIRMEN

4 - STUDENT BRANCH ORGANIZATION

(125 STUDENT BRANCHES)

STUDENT BRANCH

COUNSELOR (FACULTY ADVISOR)
CHAIRMAN
VICE CHAIRMAN
SECRETARY
COMMITTEE CHAIRMEN

SEPTEMBER 1943

At times special information is made available by the Institute, an example of which is the LIGHTNING REFERENCE BOOK. This large volume, now out of print, contained every important paper on lightning and its relation to electrical design which had been presented before the AIEE or had appeared in other leading publications.

Still another illustration is the volume on DEFINITIONS OF ELECTRICAL TERMS. It has been approved as the American Standard by the American Standards Association and as the Canadian Standard by the Canadian Engineering Standards Association. This book has over 300 pages and includes definitions of over 5000 terms used in electrical engineering. It is profusely illustrated by formulae, diagrams and symbols. It is popularly priced at $1 and is a "must" for every electrical engineer's technical book shelf.

Technical Contributions Through Institute Channels

The Institute is the framework through which the contributions of its members are developed, crystallized, and presented to the public for the benefit of all.

One of the characteristics of a peace time industrial age is that mechanical and electrical commodities are produced in quantity. In no civilization prior to this has quantity production been achieved except through human slavery. The freeing of humanity is one of the great services rendered mankind, and in this, engineers and scientists have played an important role.

The Institute has performed a vital part in this period of social change, largely through the efforts of its Technical Committees. These committees which cover the entire field of electrical engineering, meet regularly to consider material in their respective areas. Technical papers are submitted to them and are carefully considered before being presented before the Institute, thus providing an orderly authoritative means for maintaining standards of paper presentation as befits the profession, and to which any Institute member can be a party. This is a most vital pillar in the professional society accomplishment structure, and the fact that it is too frequently given little credit is at once a compliment to those who maintain it and an added thought for those who would bring to all electrical engineers the need for their support of the Institute. This one safeguarding fundamental feature provides the foundation for orderly advancement where chaos would otherwise prevail.

The pages of ELECTRICAL ENGINEERING and the annual summarization of technical contributions made available in the TRANSACTIONS, are replete with information which can aid every electrical engineer in his own particular field of endeavor. He thus has a means of keeping informed on the advance being made in theory, practice and developments as an aid in enlarging his knowledge so as to make himself more valuable in his present job.

Engineers have found that the demands of their profession require continual study. Changing conditions and new developments impose the necessity, if not the duty, for alertness of the first order. That is why every opportunity for the interchange of information is being taken advantage of so universally.

In this connection, perhaps the best means for indicating what the Institute is continually doing to help electrical engineers keep abreast of the times, is to list the titles of a few of the papers which have appeared in ELECTRICAL ENGINEERING and in the TRANSACTIONS in a manner that would illustrate the range of technical problems being dealt with.

For this purpose it is, of course, possible to list only a fraction of the thousands of papers which have been published under the auspices of the Institute. The titles have been selected as representative of the sort of thing that might be of interest to engineers engaged in the fields defined in the heading of each list. Many more could have been indicated in each field but space prohibits doing so. We are more interested here in stimulating further use of the information which is available than in the specific material referred to herein.

The remaining portion of this booklet includes the titles of some of the extensive material made available in past issues of ELECTRICAL ENGINEERING and in the TRANSACTIONS.

APPENDIX

The APPENDIX includes, in general, a partial list of papers and other material which has appeared in ELECTRICAL ENGINEERING, the TRANSACTIONS, or in pamphlet form in the past ten years. It is hoped that these references will serve to indicate the scope of the broad field of electrical engineering and stimulate further investigation by the membership.

The references have been classified by the various subdivisions of the electrical field as represented by the several technical committees of the Institute. A group of general references and a group of historical references have also been included because of their wide interest to all electrical engineers.

The following twenty-four reference lists are included:

1 — General Interest
2 — Air Transportation
3 — Automatic Substations
4 — Basic Sciences
5 — Communication
6 — Domestic and Commercial Applications
7 — Education
8 — Electric Welding
9 — Electrical Machinery
10 — Electrochemistry and Electrometallurgy
11 — Electronics
12 — Industrial Power Applications
13 — Instruments and Measurements
14 — Land Transportation
15 — Marine Transportation
16 — Power Generation
17 — Power Transmission and Distribution
18 — Protective Devices
19 — Production and Application of Light
20 — Research
21 — Safety
22 — Standards
23 — Therapeutic Applications
24 — Historical Interest

In each group the subjects are listed by (1) subject (2) author(s) (3) date of publication and (4) where available. The key for locating references is shown below.

Key for Locating References

(a) 645e indicates page 645 ELECTRICAL ENGINEERING.
(b) 385t indicates page 385 AIEE TRANSACTIONS.
(c) * indicates price to AIEE members by mail.
(d) Where year only is given (i.e. 1941) the page reference will be found in the SUPPLEMENT TO THE TRANSACTIONS SECTION OF ELECTRICAL ENGINEERING.
(e) It will facilitate finding references in bound volumes to have in mind that the pages of ELECTRICAL ENGINEERING and of the TRANSACTIONS (including Supplements) are each numbered consecutively from the beginning to the end of each year.

1 • GENERAL INTEREST

1. *The Institute's First Half Century.* Charles F. Scott. May 1934. 645e.
2. *Reading List for Junior Engineers.* Selected. (1) December 1934. 1667e. Natural Science. (2) January 1935. 133e. (a) Philosophy and Religion (b) Psychology. (3) March 1935. 345e. Economics and Sociology. (4) April 1935. 456e. (a) Business and Industrial Management (b) History. (5) May 1935. 569e. (a) Biography and Travel (b) Fine Arts. (6) June 1935. 681e. (a) Literature (b) General.
3. *The AIEE as an Educational Institution.* J. Allen Johnson. February 1935. 146e.
4. *Structure of the Electrical Engineering Profession.* T. J. Hoover. July 1935. 695e.
5. *Power and People.* John C. Parker. March 1937. 305e.
6. *Engineering and Economic Progress.* H. G. Moulton. May 1937. 510e.
7. *The Engineer and His Relation to Government.* Vannevar Bush. August 1937. 928e.
8. *The Young Engineer's First Year in Industry.* F. L. Eidmann, May 1938. 206e.
9. *The Role of the Engineering Library.* H. W. Carver. July 1938. 291e.
10. *Experience from the New England Hurricane.* Symposium. March 1939. (1) 99e. (2) 102e. (3) 105e. (4) 107e. (5) 109e. (6) 111e.
11. *Enterprise and Social Progress.* Virgil Jordan. May 1939. 193e.
12. *A Model Law for the Registration of Engineers.* C. R. Beardsley. September 1939. 374e.
13. *Should Engineers Join a Union?* R. W. Sorensen. June 1940. 227e.
14. *Total Security — A Challenge.* Charles E. Wilson. March 1941. 99e.
15. *Complacency in Confusion.* R. E. Doherty. May 1941. 199e.
16. *Making Democracy Work.* H. Coonley. July 1941. 313e.
17. *The Potential of Inter-American Economics.* C. A. McQueen. January 1942. 25e.
18. *The Second Mile.* W. E. Wickenden. May 1942. 242e.
19. *Inventions, Patents, and the Engineer.* W. E. Crawford. January 1943. 10e.
20. *Planning for Things to Come.* H. S. Osborne. August 1943. 333e.

2 • AIR TRANSPORTATION

1. *Electricity Aloft.* S. P. Johnston. April 1937. 406e.
2. *Science and The Future of Aviation.* I. I. Sikorsky. April 1938. 149e.
3. *Optimum Voltage for Airplanes.* V. H. Grant and M. F. Peters. October 1939. 428e.
4. *Instrument Landing of Aircraft.* General. December 1940. 495e.
5. *Future Trends in Air Transportation.* G. Loening. February 1941. 57e.
6. *Automatic Control of Aircraft.* C. D. Barbulesco. March 1941. 122e.
7. *Applications of Electric Power to Aircraft.* T. B. Holliday. May 1941. 218e.
8. *Airport Lighting.* H. J. C. Pearson. March 1942. 119e.
9. *Electrification of the Chicago Airport.* H. W. Baumer. July 1942. 341e.

10. *The Power Recovery System of Testing Aircraft Engines.* G. E. Cassidy and Others. May 1943. 240t.

3 • AUTOMATIC SUBSTATIONS

1. *A Self Checking System of Supervisory Control.* M. E. Reagan. October 1938. 600t.
2. *A New Time Standard.* H. E. Warren. March 1940. 137t.
3. *Bibliography on Automatic Substations 1930-41.* AIEE Comm. December 1942. $.25.*
4. *Automatic Reclosing Equipment on Stub Feeders.* AIEE Comm. May 1943. $.20.*
5. *Conductors for Supervisory Control and Telemetering.* AIEE Comm. May 1943. $.25.*

4 • BASIC SCIENCES

1. *What is Electricity?* P. R. Heyl. January 1936. 4e.
2. *Spinning Atoms and Spinning Electrons.* K. K. Darrow. October 1937. 1228e.
3. *The Dielectric Circuit.* D. D. Ewing. December 1937. 1434e.
4. *Electron Theory.* R. G. Kloeffler. January 1938. 26e.
5. *Tensors in "Words of One Syllable."* H. H. Skilling. September 1938. 378e.
6. *Mechanical Demonstrator of Traveling Waves.* C. F. Wagner. October 1939. 414e.
7. *The Ionosphere.* K. K. Darrow. July 1940. 272e.
8. *Traveling Waves on Transmission Lines.* E. Weber. June 1942. 302e.
9. *Electrical Concepts at Extremely High Frequencies.* S. Ramo. September 1942. 461e.
10. *Ultrashort Electromagnetic Waves.* Series. (1) March 1943. 103e. Theory. (2) April 1943. 159e. Transmission. (3) May 1943. 206e. Generation. (4) June 1943. 235e. Propagation. (5) July 1943. 303e. Radiation. (6) August 1943. 338e. Radiation. (7) September 1943. 405e. Reception.

5 • COMMUNICATION

1. *Teletypewriter Exchange Service.* Symposium. September 1936. (1) 961e. (2) 1015e.
2. *Inductive Coordination.* J. O. Coleman and R. F. Davis. January 1937. 17e.
3. *The Ultrahigh Frequency Domain.* A. N. Goldsmith. June 1937. 662e.
4. *Cable Carrier Telephone Systems.* Symposium. May 1938. (1) 227t. (2) 237t. (3) 245t. (4) 250t.
5. *Crossbar Dial Telephone Switching System.* F. J. Scudder and J. N. Reynolds. May 1939. 179t.
6. *Television.* G. R. Town. August 1940. 313e.
7. *Evolution of Frequency Modulation.* E. H. Armstrong. December 1940. 485e.
8. *Developments in Telegraph Switching.* F. E. d'Humy and H. L. Browne. February 1940. 71t.
9. *Network Broadcasting.* C. A. Rackey. January 1941. 16e.
10. *An Electromechanical Calculator for Directional Antenna Patterns.* C. E. Smith and E. L. Gove. February 1943. 79t.

6 • DOMESTIC AND COMMERCIAL APPLICATIONS

1. *Some Engineering Contributions to Society.* R. C. Muir. May 1937. 518e.

2. *Sterilization by Ultraviolet Radiation.* S. G. Hibben and P. W. Blackburn. November 1938. 455e.
3. *Electricity Aids in the Search for Oil.* D. Silverman. November 1939. 455e.
4. *Million Volt Industrial X-Ray Unit.* General. December 1941. 571e.
5. *Design Factors in Domestic Motored Appliances.* L. C. Packer. 1941. 500t.
6. *Automatic Control of Washing Machines.* W. J. Russel. February 1942. 89e.
7. *Utilization Voltages.* H. P. Seelye. March 1942. 147t.
8. *Heating by Reversed Refrigeration.* R. D. Heitchue. November 1942. 556e.
9. *The Electric Pasteurizer.* J. I. Hall. February 1943. 61e.
10. *Rural Electrification and Electroagricultural Engineering.* M. M. Samuels. April 1943. 193t.

7 • EDUCATION

1. *Science Series for Electrical Engineers.* (1) November 1933. 752e. Probability. (2) January 1934. 3e. Electron. (3) February 1934. 239e. Discharges. (4) March 1934. 388e. Discharges. (5) April 1934. 511e. Discharges. (6) June 1934. 851e. Valence. (7) July 1934. 1054e. Emission. (8) August 1934. 1149e. Photoelectricity. (9) September 1934. 1246e. Ferromagnetism. (10) October 1934. 1339e. Calculus. (11) November 1934. 1435e. Gases. (12) December 1934. 1563e. Fields. (13) January 1935. 3e. X-Rays.
2. *The Pitt-Westinghouse Graduate Program.* H. E. Dyche and R. E. Hellmund. January 1934. 103e.
3. *Engineering Education is Meeting the Challenge.* H. W. Bibber. October 1934. 1356e.
4. *An Advanced Course in Engineering.* A. R. Stevenson and A. Howard. March 1935. 265e.
5. *Engineering Education Needs a "Second Mile."* W. E. Wickenden. May 1935. 471e.
6. *The Young Engineer Under Changing Conditions.* R. E. Hellmund. April 1936. 329e.
7. *Status of the Engineering Profession.* Bureau of Labor Statistics. (1) August 1936. 863e. Education. (2) February 1937. 216e. Unemployment. (3) May 1937. 524e. Employment. (4) June 1937. 655e. Employment Security. (5) September 1937. 1089e. Income. (6) November 1937. 1353e. Income Sources. (7) December 1937. 1450e. Monthly Earnings.
8. *Present Trends in Engineering Education.* ECPD. April 1940. 152e.
9. *Evening Courses at Graduate Levels.* R. Beach. February 1942. 88t.
10. *The Technical High School Trains for Life.* C. E. Crofoot. September 1942. 452e.

8 • ELECTRIC WELDING

1. *Electric Arc Welding Apparatus.* AIEE Comm. January 1934. $.20.*
2. *Resistance Welding Apparatus.* AIEE Comm. January 1934. $.15.*
3. *Machine Characteristics for Steady Welding.* F. Creedy and Others. September 1934. 1268e.
4. *Arc Welding in Argon Gas.* G. E. Doan and W. C. Schulte. November 1935. 1144e.
5. *The Resistance Welding Circuit.* C. L. Pfeiffer. August 1936. 868e.

6. *Developments in Ignitron Welding Control.* J. W. Dawson, December 1936. 1371e.
7. *Sealed-Off Ignitrons for Welding Control.* D. Packard and J. H. Hutchins. January 1937. 37e.
8. *Recent Advances in Resistance Welding.* AIEE Comm. January 1938. 37t.
9. *Power Supply for Resistance Welding Machines.* AIEE Comm. May 1940. 306t.
10. *Resistance Welding Transients.* E. E. Kimberly. February 1942. 94t.

9 • ELECTRIC MACHINERY

1. *Lightning Protection for Transformers.* AIEE Comm. January 1936. 53e.
2. *Vibration Isolation of Machinery.* L. H. Hansel. June 1937. 735e.
3. *European Switchgear Developments.* D. C. Prince. April 1938. 155e.
4. *Stability Characteristics of Turbine Generators.* C. Concordia and Others. 1938. 733t.
5. *Special Problems of Two Pole Turbine Generators.* C. M. Laffoon and B. A. Rose. January 1940. 30t.
6. *Hydrogen Cooled Turbine Generator.* D. S. Snell. January 1940. 35t.
7. *Progress of the Art in Electrical Machinery, 1934-39.* AIEE Comm. February 1940. 103t.
8. *Overloading Transformers and Voltage Regulators.* AIEE Comm. September 1942. 692t.
9. *Overloading Distribution Transformers.* AIEE Comm. May 1943. $.15.*
10. *Overloading Current Limiting Reactors.* AIEE Comm. June 1943. $.15.*

10 • ELECTROCHEMISTRY AND ELECTROMETALLURGY

1. *Industrial Electrochemistry Advances.* C. G. Fink. September 1935. 920e.
2. *Recent Electric Furnace Developments in Europe.* D. F. Campbell. October 1935. 1048e.
3. *Engineering Developments.* P. Bunet. December 1935. 1320e.
4. *The Electrochemical Industry in Japan.* T. Takei. March 1936. 252e.
5. *Power Requirements.* J. V. Alfriend, Jr. May 1939. 208e.
6. *Federal Water Power and Electrochemical Industries.* C. G. Fink. February 1940. 59e.
7. *Electricity in Chemical Plants.* K. Pinder. February 1940. 77e.
8. *Large Electric Arc Furnaces.* B. M. Jones and C. M. Stearns. July 1941. 763t.
9. *Large Electrochemical Installations.* T. R. Rhea and H. H. Zielinski. October 1942. 733t.
10. *Voltage Transients in Arc Furnace Circuits.* J. B. Hodtum and J. B. Rice. August 1943. 556t.

11 • ELECTRONICS

1. *New Type of DC Transformers.* C. C. Herskind. November 1937. 1327e.
2. *Recent Trends in Electronic Technology.* D. G. Fink. March 1938. 100e.
3. *Some Electronic Switching Circuits.* C. C. Shumard. May 1938. 209e.

4. *The Permatron.* W. P. Overbeck. May 1939. 224t.
5. *Electrons Extend the Range — The Electron Microscope.* V. K. Zworykin. November 1940. 441e.
6. *Progress in the Use of Electronic Tubes.* S. B. Ingram and W. C. White. December 1940. 643t.
7. *Electronic Multiplier for Power Frequencies.* W. P. Overbeck. 1940. 931t.
8. *Thyratron Circuit for Theater Lighting.* C. R. Wischmeyer. 1941. 1067t.
9. *Electronics of the Fluorescent Lamp.* M. A. Townsend. August 1942. 607t.
10. *Electronic Circuit for Studying Hunting.* M. J. DeLerno and R. T. Basnett. December 1942. 603e.

12 • INDUSTRIAL POWER APPLICATIONS

1. *Methods of Electrical Prospecting.* D. G. Fink. March 1935. 293e.
2. *Electrical Developments in the Steel Industry.* R. H. Wright. November 1936. 1168e.
3. *Applications of Copper Oxide Rectifiers.* E. W. Morris. March 1938. 103t.
4. *Electrical Precipitation.* W. A. Schmidt and E. Anderson. August 1938. 332e.
5. *Electrical Equipment for Machine Tools.* B. G. Graves. January 1940. 18t.
6. *Rectifiers in the Coal Mining Industry.* D. E. Renshaw. April 1940. 242t.
7. *Radiant Heat in Industry.* P. H. Goodell. January 1941. 3e.
8. *Ignitron Rectifiers in Industry.* J. H. Cox and G. F. Jones. October 1942. 713t.
9. *Industrial Power Applications.* AIEE Comm. January 1943. $.70.*
10. *Selection of Electric Motors and Controllers.* AIEE Comm. January 1943. $.15.*

13 • INSTRUMENTS AND MEASUREMENTS

1. *High Speed Motion Pictures.* H. E. Edgerton. February 1935. 149e.
2. *Power and Energy, Positive and Negative.* L. A. Doggert and H. I. Tarpley. November 1935. 1204e.
3. *Remote Metering and Automatic Load Control.* J. T. Logan. January 1936. 40e.
4. *Supervisory Control and Remote Metering.* J. V. B. Duer. January 1936. 70e.
5. *Electronic Transient Visualizers.* H. J. Reich. December 1936. 1314e.
6. *Special Uses for the Automatic Oscillograph.* G. A. Powell and R. E. Walsh. April 1937. 438e.
7. *A New High Speed Cathode Ray Oscillograph.* H. P. Kuehni and S. Ramo. June 1937. 721e.
8. *A New A. C. Network Analyzer.* H. P. Kuehni and R. G. Lorraine. February 1938. 67t.
9. *Telemetering, Supervisory Control, and Associated Circuits.* AIEE Comm. October 1941. $.40.*
10. *Progress in the Art of Metering.* AIEE Comm. December 1941. $.25.* See also (1) September 1941. 421e. (2) October 1941. 469e. (3) November 1941. 540e. (4) December 1941. 581e.

14 • LAND TRANSPORTATION

1. *Development of the All Service Vehicle.* M. Schreiber. March 1936. 236e.
2. *Electrical Apparatus for Diesel Cars and Locomotives.* G. F. Smith. April 1936. 335e.
3. *Pennsylvania Railroad's Electrified System.* H. C. Griffith. January 1938. 10e.
4. *The PCC Street Car.* C. F. Hirshfeld. February 1938. 61t.
5. *Performance of the 3600 HP New Haven Electric Locomotives.* F. Konn and F. H. Craton. May 1939. 212t.
6. *Trends in Railroad Motive Power.* S. Witthington. April 1940. 141e.
7. *Transportation as a Social Problem.* R. S. Henry and W. J. Wilgus. September 1940. 358e.
8. *Modern Rail Transport.* A. M. Wright. October 1940. 400e.
9. *Union Pacific Steam Electric Locomotives.* M. R. Hanna and J. F. Tuttle. 1940. 756t.
10. *Train Communications.* L. O. Grandall and P. N. Bossart. July 1943. 493t.

15 • MARINE TRANSPORTATION

1. *Electricity in the United States Navy.* L. Dreller. July 1940. 267e.
2. *Electricity on the Steamship "America."* H. F. Norton and J. F. Nichols. October 1940. 398e.
3. *Alternating Current in the U. S. Navy.* H. G. Rickover. June 1942. 289e.
4. *Electrical Installations on Shipboard.* AIEE Comm. July 1940. $.75.*
5. *Wartime Supplement to Item 4.* AIEE Comm. April 1943. $.25.*

16 • POWER GENERATION

1. *Incremental Rates and Application to Load Division.* M. J. Steinberg and T. H. Smith. (1) March 1934. 432e. (2) April 1934. 571e.
2. *Survey of Hydroelectric Developments.* AIEE Comm. (1) June 1934. 988e. (2) July 1934. 1086e.
3. *Boulder Dam and Power Plant.* L. N. McClellan. June 1935. 583e.
4. *The Columbia Basin Project.* A. F. Darland. November 1937. 1339e.
5. *Switch House Modernization.* Symposium. 1939. (1) 747t. (2) 752t. (3) 761t. (4) 770t.
6. *Progress in Power Generation, 1933-39.* AIEE Comm. January 1940. 12e.
7. *Mingled Hydro and Steam Power.* A. H. Markwart. 1940. 775t.
8. *Restoration of Service on Power Systems.* Symposium. October 1940. (1) 563t. (2) 571t. (3) 575t. (4) 579t.
9. *Power System Governing.* Symposium. 1941. (1) 541t. (2) 547t. (3) 559t.
10. *Emergency Measures to Increase Output of Generating Equipment and Systems.* AIEE Comm. June 1943. $.65.*

17 • POWER TRANSMISSION AND DISTRIBUTION

1. *Constant Current D.C. Transmission.* C. H. Willis and Others. January 1935. 102e.
2. *Modernization of Transmission Lines.* AIEE Comm. January 1936. 12e.
3. *A Review of Overhead Secondary Distribution.* W. P. Holbern. January 1937. 114e.

4. *First Report on Power System Stability.* AIEE Comm. February 1937. 261e.
5. *Interconnected Electric Power Systems.* P. Sporn. January 1938. 16e.
6. *Boulder Dam Transmission Line.* Symposium. April 1939. (1) 131t. (2) 137t. (3) 140t. (4) 147t. (5) 151t.
7. *Lightning Phenomena.* C. F. Wagner and G. D. McCann. (1) August 1941. 374e. (2) September 1941. 438e. (3) October 1941. 483e.
8. *Low, Medium, and High Pressure Gas Filled Cable.* G. B. Shanklin. October 1942. 719t.
9. *Shunt Capacitors.* AIEE Comm. December 1942. $.30.*
10. *Emergency Overloads on Overhead Conductors.* AIEE Comm. May 1943. $.15.*

18 • PROTECTIVE DEVICES

1. *Bus Protection.* AIEE—EEI Comm. May 1939. 206t.
2. *Bibliography on Relay Literature, 1927-39.* AIEE Comm. July 1941. $.25.*
3. *Ten Years Progress in Circuit Interrupters.* AIEE Comm. November 1941. 523e.
4. *Ten Years Progress in Relaying.* AIEE Comm. December 1941. 590e.
5. *Ten Years Progress in Lightning Protection.* AIEE Comm. April 1942. 187e.
6. *Bibliography on Circuit Interrupting Devices, 1928-40.* AIEE Comm. May 1942. $.40.*
7. *System Overvoltages and Grounding Impedance.* AIEE Comm. December 1942. $.15.*
8. *Application and Operation of Circuit Breakers and Switchgear.* AIEE Comm. March 1943. $.15.*
9. *Application of Lightning Protection in Wartime.* AIEE Comm. May 1943. $.15.*
10. *Application and Operation of Out-of-Step Protection.* AIEE Comm. May 1943. $.20.*

19 • PRODUCTION AND APPLICATION OF LIGHT

1. *Incandescence — Some Theoretical Aspects.* S. G. Hibben. August 1934. 1201e.
2. *Progress in Production and Application of Light.* AIEE Comm. October 1936. 1111e.
3. *Low Voltage Fluorescent Lamps.* G. E. Inman and R. N. Thayer. June 1938. 245e.
4. *Fundamental Principles of Fluorescence.* G. R. Fonda. December 1938. 677t.
5. *Polarized Light.* L. W. Chubb. November 1939. 450e.
6. *Progress in the Production and Application of Light.* A. L. Powell. December 1939. 497e.
7. *Trends in High Intensity Mercury Lamps.* G. A. Freeman. November 1940. 444e.
8. *Fluorescent Lighting Advances.* Symposium. June 1941. (1) 261e. (2) 263e. (3) 264e. (4) 266e.
9. *The Incandescent Lamp Situation.* P. S. Millar. 1941. 1174t.
10. *The Carbon Arc in Industry.* W. C. Kalb. August 1942. 581t.

20 • RESEARCH

1. *Newly Discovered Elementary Particles.* K. K. Darrow. August 1935. 808e.
2. *Recent Research in Radio Communication.* F. Hamburger, Jr. August 1935. 843e.

3. *Research Work in Magnetics.* T. Spooner. December 1935. 1354e.
4. *Wave Guides for Electrical Transmission.* G. C. Southworth. March 1938. 91e.
5. *Progress in Weather Forecasting.* W. R. Gregg. October 1938. 405e.
6. *Fibrous Glass for Electrical Insulation.* R. E. Ferris and G. L. Moses. December 1938. 480e.
7. *Progress in Insulation Research.* J. B. Whitehead. January 1939. 23e.
8. *Electrical Features of the 200 Inch Telescope.* B. H. Rule. February 1942. 67e.
9. *The Cyclotron.* W. M. Brobeck. July 1942. 348e.
10. *Powder Metallurgy.* F. C. Kelley. September 1942. 468e.

21 • SAFETY

1. *Electric Shock Effects of Frequency.* W. B. Kouwenhoven and Others. April 1936. 384e.
2. *Effect of Electric Shock on the Heart.* L. P. Ferris and Others. May 1936. 498e.
3. *Effects of Electric Current on Man.* C. F. Dalziel and J. B. Lagen. February 1941. 63e.
4. *Electric Shock.* C. F. Dalziel and Others. 1941. 1073t.
5. *Bibliography on Electrical Safety, 1930-41.* AIEE Comm. July 1942. $.25.*

22 • STANDARDS

1. *The Institute in Standardization.* A. E. Kennelly. May 1934. 676e.
2. *Development of Standards Material.* V. M. Montsinger and H. E. Farrer. June 1937. 653e.
3. *Definitions of Electrical Terms.* AIEE Comm. 1942. $1.00.(1)
4. *AIEE Standards Manual.* AIEE Hdq. September 1942. Free.(2)
5. *Index to AIEE Standards.* AIEE Hdq. Free.

(1) Price in U. S. A. by Mail.
(2) Primarily for Members of Technical Committees.

23 • THERAPEUTIC APPLICATIONS

1. *Electricity in Medicine.* R. E. Williams. June 1938. 237e.
2. *Uses of Electricity in Medicine.* O. R. Langworthy. October 1940. 389e.
3. *Atom Smashing and Its Applications to Medicine.* R. D. Evans. June 1941. 250e.
4. *Radiography at High Speeds.* L. F. Ehrke and C. M. Slack. September 1941. 432e.
5. *Short Wave Diathermy Apparatus.* C. K. Gieringer. 1941. 459t.

24 • HISTORICAL INTEREST

1. *Notes on Phenomena in Incandescent Lamps.* E. J. Houston. 1884. 1t.
2. *A New System of Alternate Current Motors and Transformers.* Nikola Tesla. 1888. 305t.
3. *The Solution of Municipal Rapid Transit.* F. J. Sprague. 1888. 352t.
4. *Preliminary Report of the "Standard Wiring Table Committee."* AIEE Comm. 1890. 344t.

5. *Long Distance Transmission for Lighting and Power.* C. F. Scott. 1892. 425t.
6. *Impedence.* A. E. Kennelly. 1893. 175t.
7. *Existing Commercial Applications of Electrical Power from Niagara Falls.* W. L. R. Emmet. 1895. 482t.
8. *Propagation of Long Electrical Waves.* M. I. Pupin. 1899. 93t.
9. *The Electric Transmission of Power from Niagara Falls.* L. B. Stillwell. 1901. 445t.
10. *The Audion.* Lee De Forest. 1906. 735t.
11. *New Types of Incandescent Lamps.* C. H. Sharp. 1906. 815t.
12. *Light from Gaseous Conductors Within Glass Tubes.* D. M. Moore. 1907. 605t.
13. *The General Equation of the Electric Circuit.* C. P. Steinmetz. 1908. 1231t.
14. *Tungsten Lamps of High Efficiency.* I. Langmuir and J. A. Orange. 1913. (1) 1913t. (2) 1935t.
15. *Power from Mercury Vapor.* W. L. R. Emmet. 1913. 2133t.
16. *Method of Symmetrical Coordinates.* C. L. Fortescue. 1918. 1027t.
17. *Transoceanic Radio Communication.* E. F. W. Alexanderson. 1919. 1269t.
18. *Carrier Current Telephony and Telegraphy.* E. H. Colpitts and O. B. Blackwell. 1921. 205t.
19. *Television.* Symposium. 1927. (1) 913t. (2) 918t. (3) 940t. (4) 946t. (5) 954t.
20. *Transoceanic Telephone Service.* Symposium. 1930. (1) 621t. (2) 624t. (3) 629t. (4) 638t.

NOTE: Attention is also directed to the 50TH ANNIVERSARY NUMBER of ELECTRICAL ENGINEERING, May 1934, which contains 21 articles by leaders in the profession and 91 biographical sketches of men prominent in the history of the Institute.

INSTITUTE FINANCES

The annual dues which you pay are added to the dues paid by every other member of the Institute and these, together with all other income, go into the Institute treasury from which disbursements are made by order of the Board of Directors, who represent you and for whom you vote. The budget of expenditures is regularly printed and made available to the members, so you know at all times what is being done with the money you contribute as dues. The average income and expenditure per member for the 1941-42 appropriation year are shown in the following tabulation:

AVERAGE INCOME PER MEMBER

Membership Dues	$11.58
Entrance, Transfer and Student Fees	1.17
From Advertising in ELECTRICAL ENGINEERING	3.60
From Miscl. Subscriptions, Publication Sales, Etc.	2.57
Interest on Investments	.39
	$19.31

AVERAGE EXPENDITURE PER MEMBER

Section and Miscl. Expenses	$ 1.90
District Travel Expenses and Prizes	.21
Publications	7.89
ELECTRICAL ENGINEERING (Text Pages) (3.49)	
" " (Advertising Pages) (1.40)	
TRANSACTIONS (.76)	
Preprints of Technical Papers (.37)	
Standards and Test Codes (1.50)	
Year Book (.37)	
Committees	.55
National and District Meetings	.72
Joint Activities	1.38
Officers' Travel Expense, Etc.	.52
Headquarters	2.58
Student Activities	.52
Other Expenses, Investments, or Unallocated	3.04
	$19.31