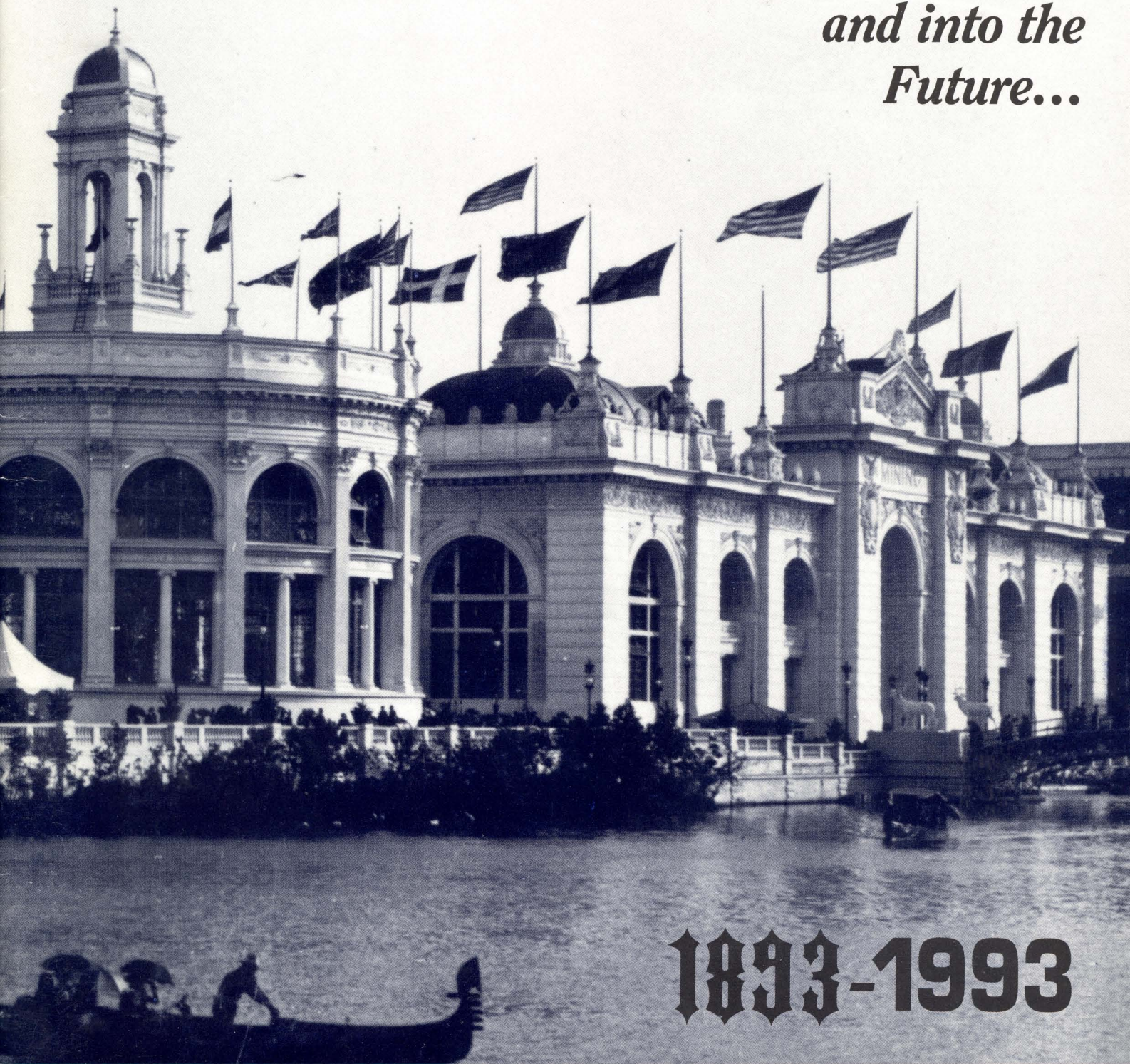




THE INSTITUTE OF
ELECTRICAL AND
ELECTRONICS
ENGINEERS, INC.

CHICAGO SECTION
CENTENNIAL

*Looking Back
and into the
Future...*



1893-1993

IEEE Chicago Section
30 N. Michigan Avenue
Suite 508
Chicago, IL 60602
312/236-IEEE

The Electricity Building carries out the Spanish renaissance idea, modified by a Corinthian treatment. It covers an area of 351 x 767 feet, north and south. The exterior walls are composed of a continuous Corinthian order of pilasters, 3 feet 6 inches wide and 42 feet high, supporting a full entablature and resting upon a stylobate 8 feet 6 inches. At each of the four corners of the building is a pavilion above which rises an open tower 150 feet high. In the center of this niche, upon a lofty pedestal, is a colossal statue of Franklin, whose illustrious name intimately connects the early history of the Republic with one of the most important discoveries in the phenomena of electricity. The building with its large window spaces and high central and corner towers, is especially designed for electrical illuminations by night.

The interior of this magnificent building presented at night a scene of mysterious grandeur that no pen can describe. The principal attraction was probably the famous Edison Tower of Light which stood in the very center of the building. The Temple of Electricity was one of the most popular buildings on the ground.

— Chicago Historical Society

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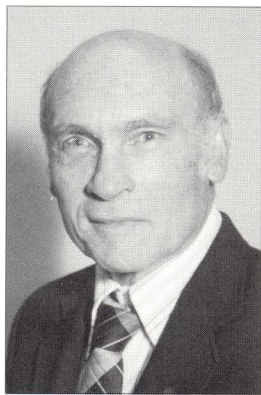
Forward

This Centennial Book represents a time capsule created by the Chicago Section of the Institute of Electrical and Electronics Engineers (IEEE). Unlike most time capsules there is no need to wait before it can be examined to understand the Chicago Section's accomplishments over the first century of its existence. This book can be read now, and we hope it will remain a keepsake and a reminder of the contributions electrical engineers have made to our society.

The Centennial Committee invited members, non-members, suppliers and educational institutions to participate in the Chicago Sections's 100 year celebration on October 9, 1993. What follows is a review of the special event, as well as articles of significance by various authors. These highlight our founding at the World's Columbian Exposition of 1893, our history and our Centennial Celebration. This book provides us with a glimpse of the progress electrical engineering technology has made and its impact upon our everyday lives. It also recognizes those engineering professionals who elected to contribute to the well-being of their profession by donating their time and efforts to the advancement of the IEEE Chicago Section.

— October 1993

Chicago Section Executive Committee



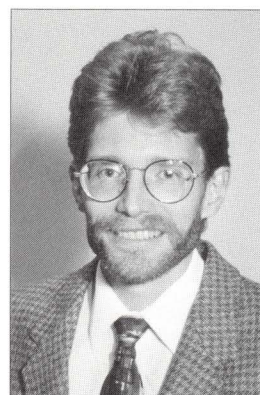
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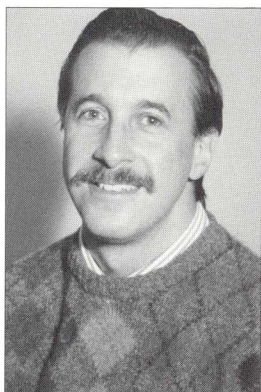
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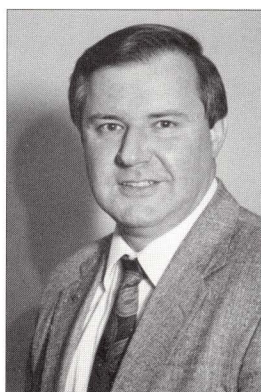
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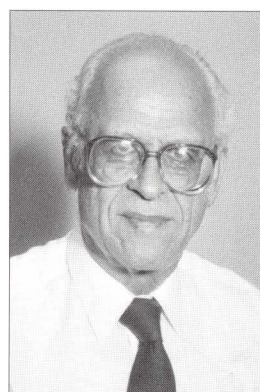
Dave Schumacher



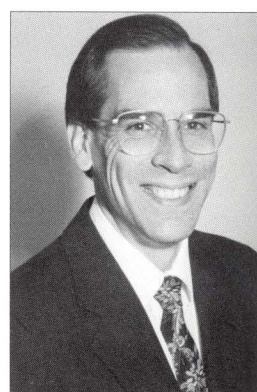
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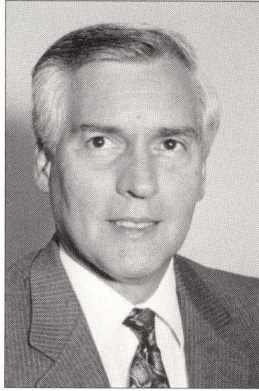
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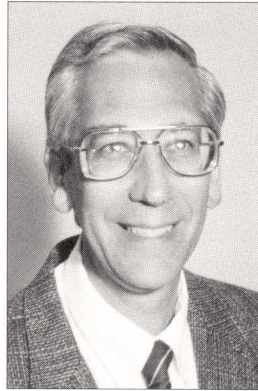
Centennial Committee



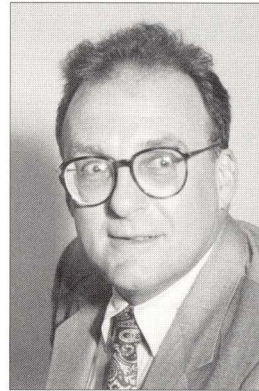
Dennis Lamont



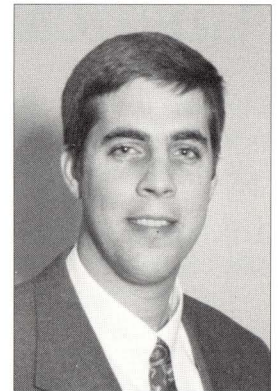
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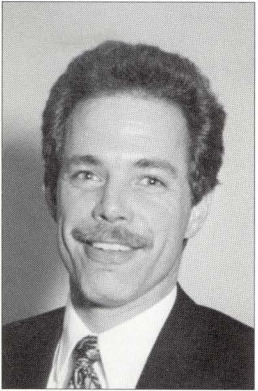
Barry Brusso



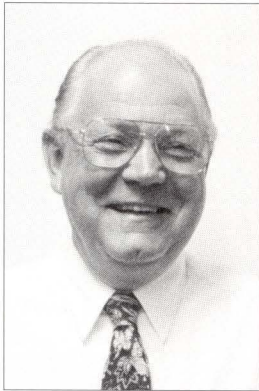
Jim Carroll



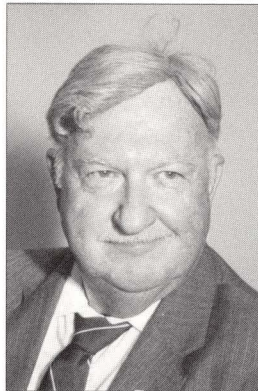
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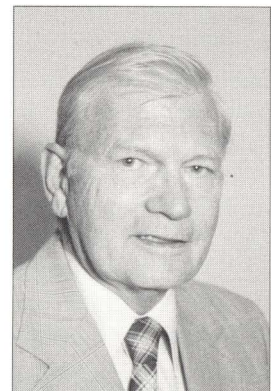
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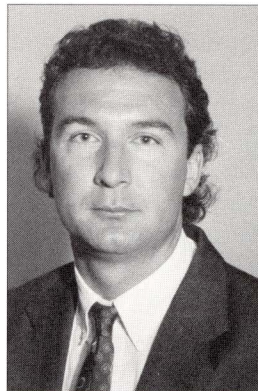
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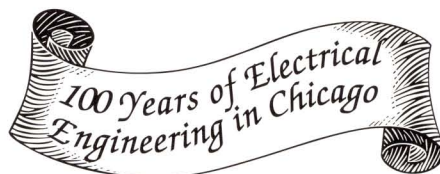
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A History of the Chicago Section of the American Institute of Electrical Engineers

Prepared by Francis Cox and presented at the Fall, 1956 meeting held in Chicago

Activities of Chicago Section — 1893 to 1902

The American Institute of Electrical Engineers was founded in 1884 with headquarters in New York. By 1893, it had 673 members, the major part of whom lived in the larger cities of the United States. At the time of the World's Fair in Chicago in 1893, there was a demand for meetings outside of New York in some of the larger cities. On this account, a committee was appointed to consider the holding of such meetings in some of these larger cities. Late in 1893 a plan was adopted providing for the appointment by the Council of a Local Honorary Secretary in any city upon petition of 20 or more members and authorizing the holding of local meetings in any city where such an official had been appointed. Such meetings were to be held simultaneously with the Institute meetings in New York or afterward for the purpose of discussing papers accepted by the Institute. The local members were to elect their own chairman, usually a different one for each meeting. The committee recommended against the creation of any separate local organizations. The method of having each local organization represented by a Local Honorary Secretary is still adhered to in foreign countries where sections are not authorized.

In February 1894, Mr. Edward Caldwell of Chicago sent petitions, signed by 21 members, to the Institute in New York requesting meetings in Chicago. Each copy had a place at the bottom to fill in the name of the member recommended for Local Honorary Secretary. Mr. Caldwell was recommended by a large majority, and he was appointed by the committee.

On March 21, 1894, a meeting was held at Armour Institute, simultaneously with a meeting in New York and Mr. A.S. Hibbard of the Chicago Telephone Company was elected Chair-

man in Chicago for this first meeting. D.C. Jackson, Sr., read a paper by Professor W. A. Anthony entitled, "On the Effect of Heavy Gases in the Chamber of an Incandescent Lamp." A report on the meeting and discussion of the Anthony paper can be found in *Trans.*, April 1894, pp. 186-191

Other meetings were held in 1894 on the following dates:

- The second meeting was held April 25. Lieutenant Samuel Rodman, Jr. acted as Chairman.
- The third meeting was held May 23, 1894.
- At the September meeting held on the 19th, Mr. B. J. Arnold's appointment of Local Honorary Secretary was announced.

Meetings were held in Chicago on this basis until the Chicago Section was formed under a new plan, like the present one, in 1902. However, in the list of sections, Chicago has the date of establishment as 1893 and no other section was established prior to 1902.

It is possible that the World's Fair had some influence in hastening the establishment of the Chicago Section because many meetings were held here at that time in connection with the International Electrical Congress, which was attended by many New York members. It seems that Mr. Edwin J. Houston, after attending the I.E.C., read a paper in New York on September 20, 1893. The subject was "International Electrical Congress and World's Fair of 1893." He was greatly impressed by the growth of the nation west of the Hudson River, but was most impressed by what he called "that extra-mural younger potentially greater Chicago called the Great White City." He was most profuse in his descriptions, praise of the City, and the World's Fair and particularly in the advances made in the nine years from 1884, the time of the International Electrical Exhibition in Philadelphia, till 1893. It is quite likely that this paper had some influence on the conservative members of the Council of the Institute in New York.

At the Anthony meeting of March 21, 1894, referred to above, the Chicago meeting was connected by telephone with the Institute rooms in New York, the telephone connections having been arranged by Mr. A.S. Hibbard general manager of the Chicago Telephone Company and Chairman of the meeting. This appears to have been the first regular Institute meeting held in Chicago and almost amounted to a joint meeting with New York. There were approximately 45 members and guests present. The discussion was probably held on the same evening.

At the second meeting held on April 25, 1894, Mr. I. H. Farnham, probably of the Boston Telephone Company, read a paper on "Electrolytic Effects"

The subject of the third meeting held on May 23, 1894, was "Discriminating Lightning Arresters and Recent Progress in Means for Protection Against Lightning." The speaker was Mr. Alexander Jay Wurts, a leading authority in the field at that time. A description was given of an experiment on a 3000 volt A.C. circuit. The meeting was held at Armour Institute. Mr. B. J. Arnold acting as Chairman.

Papers by some Chicago Members in 1902-03

The "Telephonic Status Quo" by Arthur Vaughan Abbott, Chief Engineer, Chicago Telephone Company, was read in both Chicago and New York. The meetings in Chicago were mostly discussions of papers previously given in New York and convention papers. The subjects considered were, Electric Elevators, Illumination, Telephony, and Electric Pneumatic Systems. In addition to these, Mr. B. J. Arnold read a paper on the "Relative Cost of Steam and Electric Railway Operation." It is interesting to note that some attention was also paid at this time to the Education of Electrical Engineers.

In 1901-1902-1903, the Chicago Section was very active in several different lines of electric development. Mr. J.G. Wray, Chicago Telephone

Company, presented a paper on "Telephone Traffic" and S. G. McMean, Central Union Telephone Company, presented a paper on "The Telephone Engineer." Peter Junkersfeld, Chicago Edison Company, presented a paper on "Multiple vs. Independent Operation of Units and of Central Stations." Louis A. Ferguson, Chicago Edison Company, presented a paper on "Distribution of Electrical Energy in Large Cities." Both, this paper and that of Peter Junkersfeld, were read and discussed both in New York and Chicago. There was also considerable discussion about 25 and 60 cycle currents and arguments for two-phase vs. three phase distribution. Standards were given much attention in 1903, particularly of E.M.F. Electric railways received considerable attention and high tension transmission lines with their lightning and ground wires. No one appeared to be satisfied with his existing knowledge and eagerly sought to learn from the experience of others.

Metering of electric energy was studied and a paper was presented to the Chicago Section about 1903 by John D. Hies, then a member of the Faculty of Lewis Institute and Design Engineer for the Kimble Electric Company. Then there were comparisons between electric motors and steam locomotives for railway operation. For this purpose, the Metropolitan Elevated using, at that time, steam locomotives, were used as typical examples. Needless to say, from an economy standpoint the electric railway was the winner of the contest.

Voltages as high as 6000 volts for transmission were discussed and suspension type insulators were recommended for these high tension lines. Also single-phase power transmission for railways was considered and discussed as being especially suitable for this purpose because of its adaptability for regeneration of power for braking on down grades or when coming to a stop, and also because of its use of series motors.

During this period, wireless telegraphy received attention and Lee De Forest and others became active. It is the opinion of the writer that no electric development prior to this time had ever attracted as much public interest as a wireless telegraphy. This was some-

thing every youngster could work at as long as it remained simple. In 1908, Fessenden presented a paper on "Wireless Telephony." This paper brought up a controversy between Congress and the Administration concerning protection of patentees against infringement. Congress passed the bill but President Theodore Roosevelt refused to sign it although he was strongly urged to do so by members of the Cabinet. The bill must have become a law without the President's signature but it still remains for the patentee to prove the validity of the patent.

About this time, Steinmetz introduced his paper on the "General Equations of the Electric Circuit." This paper was presented at the 25th Annual Convention and made quite a stir at the time because it greatly simplified the solution of problems which before had been rather long and intricate.

In 1910, Mr. H. B. Gear presented a paper before the Chicago Section on "The Diversity Factor in Chicago." This factor has been studied quite diligently since that time and is admittedly of considerable importance in loading generating stations.

Mr. Arthur Bessey Smith of the Au-

tomatic Electric Company, had an article on "The Automatic Telephone in Relation to City Service." This telephone operated on the "step-by-step" principle and was largely used by independent telephone companies for several years in many of the smaller and medium sized cities of the United States and in foreign countries.

About 1906, a students' Branch of A.I.E.E. was formed at Armour Institute under the Chicago Section and a similar Branch at Lewis Institute in 1908. These two branches were consolidated into one when Armour and Lewis Institutes "joined hands" in 1940. A third branch was formed at Northwestern University about this time but information concerning the exact date is not available.

In 1911, the 28th Annual Convention of the Institute (A.I.E.E.) was held in Chicago, June 26-30. This was the second meeting of the Institute in Chicago, the first having been held here in 1892. Since 1911 Chicago has been host to the following General meetings of the Institute:

- Summer — 1924, 1933, 1942
- Fall — 1947

Signers of Petition for Local Meetings in Chicago

Prepared by: Don Harris

Info from: Francis Cox, George Spisak

Transmitted by Edward Caldwell, February 20, 1894

Charles G. Armstrong .. A '92 (Sept. 27)	Fred De Laud A '92 (Feb. 16)
B. J. Arnold A '92 (Oct. 25), M '93	C. C. Haskins A '93 (Sept. 20)
F. B. Badt (Lt.) A '92 (Apr. 19)	Samuel Insull A '86 (Dec. 7)
A. H. Bauer A '90 (Feb. 7), M '91	Elbert F. Norton A '93 (Dec. 20)
N. H. Bentley A '93 (Oct. 18)	S. E. Nutting A '93 (Sept. 20)
Lem S. Boggs A '93 (Sept. 20)	R. S. Pierce A '93 (Apr. 18), M '93
Charles A. Brown A '87 (July 12)	William D. Ray A '92 (Sept. 27)
Edward Caldwell, Chairman of Committee A '91 (Jan. 20)	Samuel Rodman, Jr. A '90 (Sept. 16)
Louis K. Comstock A '93 (Dec. 20)	Henry J. Sage A '93 (Dec. 20)
F. W. Cushing A '91 (Nov. 24)	Leland L. Summers A '92 (Feb. 16)
	Charles Wirt A '88 (Sept. 8)

Excerpt of the Inaugural Address of the President at the Seventy-ninth Meeting of the American Institute of Electrical Engineers, New York, September 20, 1893

THE INTERNATIONAL ELECTRICAL CONGRESS

— AND —

WORLD'S FAIR, OF 1893.

BY EDWIN J. HOUSTON.

GENTLEMEN:—During the past few months a mighty human stream, daily increasing in volume, has continually flowed towards a single centre of population in the North American continent. This stream, fed from all parts of the earth, is formed by the many millions who are journeying toward the World's Fair, to do honor to those four hundred years' growth of the greatest Republic the world has ever seen.

Many of us have but recently left this mighty stream. Like others we visited Chicago to become eye-witnesses of the nation's growth. But not for this alone; perhaps the principal incentive to most of us has been a desire to take part in the International Electrical Congress of 1893, not only because we are especially interested in the progress of electrical science, but also because we are members of the AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, with whom the first conception of this Electrical Congress originated.

It has occurred to me that in a brief inaugural address to the INSTITUTE, I could not select a better topic than the International Electrical Congress and World's Fair of 1893. I will, therefore, give you a few thoughts on this subject.

As in our journey we crossed the mighty continent, we saw on every side evidences of its vast mineral and agricultural wealth. As we passed through its populous cities and at last reached Chicago we wandered through its streets and examined with admiration the long rows of stately buildings. In all these things we rejoiced at the growth of a nation that has achieved so much in so short a time. But was it not in that extra-mural, younger, but potentially greater Chicago, ye'd "The Great White City," that we were most impressed? Its grandly proportioned buildings that arose as if by magic would have rendered a distant journey profitable, as a mere architectural display. But when we crossed their portals and examined the rich exhibits, collected from all parts of the world, we rejoiced in these proofs both of the nation's and of the world's progress.

But the growth of the American Republic during the four hundred years that have passed since its discovery by the Genoese Navigator, marvellous as it has been, is less astonishing to us as electricians than the extraordinary development in that vigorous science, electricity, to which many of us have devoted the energies of our lives. Contrasting the World's Fair of Chicago, of 1893, which embraces exhibits in all departments of man's skill and industry, with the Philadelphia International Exhibition, of 1884, which, as you remember, was devoted wholly to electricity, I think you will agree with me that we have ample reason to rejoice at the progress made in the electrical field during the past nine years.

I have no sympathy with the unthinking critic who expresses disappointment with what he chooses to style the meagerness of the electrical display of the Chicago Exhibition. He probably estimates the value of an exhibit by the number of square feet of floor space it covers, rather than by its inherent possibilities. To my mind many exhibits whose actual demand for floor space are limited to less than one hundred square feet, would, were

they estimated from the standpoint of their true value, demand more than the entire area of the exhibition grounds for their display.

Such critics fail to appreciate the fact that not in the Electricity Building alone, but throughout the entire exhibition as well, there is to be seen a grand display of the wonder working force of electricity. Almost countless are and incandescent lights turn night into day, both in the buildings and over the extended areas outside them. Powerful search lights flash their bright beams far and wide beyond the gates of "The White City." Electric launches on the lagoons, and electric cars on the Intra-mural Railway show by actual practice the power electricity possesses in systems of transportation. Systems of telegraphic and telephonic communication vie with systems of time transmission, annunciator, fire, burglar and temperature alarms, both in Electricity Building and elsewhere, not only as exhibits pure and simple, but also in that shape which we, as practical men, so delight to see as representing the highest type of scientific achievement; viz., in every day practice.

I think no one will question the completeness of the electric motor exhibit. Both in Electricity Building and elsewhere, electric motors in many forms are to be seen performing work, varying in amount from that required to move the most delicate machinery, to that capable of driving a full size locomotive. Nor is the exhibit of dynamos incomplete. An excellent display is made in Electricity Building, while a fair proportion of the entire floor space of the Palace of Mechanic Arts is occupied by working dynamos, not so much as an exhibition, as a great central lighting station established for the illumination of the buildings and grounds.

Perhaps the most striking proof of the advance that has been made in electricity since the time of the International Electrical Exhibition of 1884 in Philadelphia, a period less than a single decade, is that many of the achievements of electricity have proved such boons to the world, and have so thoroughly come into every day use that they have ceased to be regarded as wonders. It therefore, no more enters into the minds of those who are operating electrical apparatus embodying such achievements, that they form proper objects for exhibition, than it would for them to exhibit any other universally good thing, such as sunshine, air or water.

Even we, who know better, are apt to follow the lead of the unreflecting and are often too ready to relegate some nine-days wonder of electricity to the domain of the common and prosaic. We speak through a conducting wire, and the world wonders that the potentiality of the intricate waves of articulate speech can be so transmitted. We examine the mechanism of the apparatus, understand its operation and promptly cease to wonder, since we see that such mechanism must be operative. We extend the distance through which we can thus carry on intelligible speech, until it reaches to over a thousand miles. Again a nine-days wonder, and the world freely gives its plaudits to the brainy men who have contributed to this success; but in a short time even this achievement is tacitly relegated to the ordinary and the common, and it therefore ceases to be regarded as a thing worthy of special exhibition.

When, through the courtesy of the American Bell Telephone Company, I was permitted, as were doubtless many of you, to carry on an extended conversation between Chicago and New York, or even between Chicago and Boston, by the long-distance telephone, the apparatus must have seemed to you, as it did to me, a great achievement, and one which particularly accentuated the wonderful recent growth of electrical science.

But these inventions do not stand alone. There are many others. Take, for example, the telautograph, of Gray; the radiophone, of Bell; the Cuttriss syphon-recorder, of the Com-

radiophone, of Bell; the Cuttriss syphon-recorder, of the Commercial Cable Company, the practical welding process of Elihu Thomson; or consider some of the many brilliant discoveries which Tesla gave to the world but a few years ago, but which are even now almost regarded as old; or consider some of the possibilities at which the same investigator hinted in his recent lecture in Chicago on mechanical and electrical oscillators; or look at the almost innumerable improvements in the details of apparatus, or of systems of distribution, little things in themselves, but such little things as determine the difference between success and failure; or consider the thousand and one other novelties with which you are acquainted, and which doubtless called from you much admiration for the ability of their ingenious inventors.

But I will go no further in this direction. I will content myself to submit to your judgment, being sure of a favorable verdict, the correctness of the belief above expressed, that electrical science has made wonderful progress since 1884, and that such progress has not failed to receive proper and extended exhibition at the World's Fair in Chicago in 1893.

The Chicago Exhibition still exists. It may yet be visited and compelled still further to yield its intellectual benefits.

But the Chicago International Electrical Congress of 1893 has come and gone. That it has accomplished much lasting good, I think there can be no reasonable doubt. That it might have accomplished more under a more liberal leading there can, I think, be equally no doubt. But, taking all in all, I feel that the electrical fraternity throughout the world are to be sincerely congratulated on the results of its work.

Report of Committee on Local Meetings

TO THE COUNCIL.

Your Committee, appointed at the meeting of the Institute of October 18th, to consider the subject of Local Meetings, beg to report as follows:—

1st. It is the opinion of the Committee that provision should be made for local meetings of the members at points inconveniently distant from New York for the reading and discussion of papers accepted by the Institute.

2d. The Committee is of opinion that the provision in Section VI. of the Rules of the Institute, authorizing the Secretary to "call a special meeting on a requisition signed by fifteen or more members" was not intended to and does not cover local meetings of the character contemplated in this report.

3d. The Committee presents the following plan for the holding of local meetings of members:—

A. When not less than twenty members in any stated locality shall in writing notify the Secretary of the Institute of their desire to hold local meetings, such request shall be presented to the Council at its first meeting thereafter. The Council shall then, upon the recommendation and nomination of the signers of the request for local meetings, appoint a Local Honorary Secretary, who shall be a member, or associate member of the Institute residing in the specified locality.

B. The duties of a Local Honorary Secretary shall be in general to serve as a channel of communication between local members and the general body of members through the Secretary and Council. But no member in any locality shall be debarred from direct communication with the Institute.

C. In any locality where a Local Honorary Secretary shall have been appointed, local meetings may be held, the local members to elect their own chairman, such meetings to be known as MEETING OF THE ——— MEMBERS OF THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, and such meetings shall be for the purpose of reading, by the authors or by proxy, and of discussing, papers accepted by the Institute and such papers only. Such local meetings shall be held simultaneously with the Institute meetings or subsequently; that is to say, no paper before the Institute shall be read or discussed at a local meeting in advance of its reading at the Institute meeting.

D. Wherever local meetings shall have been provided for, as in the foregoing section, the Local Honorary Secretary shall be supplied, by the Secretary of the Institute, with a suitable number of advance copies of papers to be read before the Institute, which copies he may distribute to the local members at their local meetings. The Local Honorary Secretary shall transmit to the Secretary of the Institute a report of the discussions at each local meeting, together with any written discussions or comments on papers that he may receive from members in his locality. Any member or associate may introduce a stranger to any meeting, but the latter shall not take part in the pro-

ceedings without the consent of the meeting.

E. The Local Honorary Secretary shall transmit to the Secretary of the Institute all papers offered by local members, but any member may send papers directly to the Secretary of the Institute.

F. The publication of the discussion at local meetings in the Transactions of the Institute shall be subject to the same regulations and restrictions as govern the publication of discussions at the regular meetings of the Institute. No publication of papers or discussions at local meetings in local or other journals or newspapers is to be permitted without the sanction of the Council or the Secretary of the Institute.

G. The expense of local meetings shall be borne by the local members and shall not become a charge upon the funds of the Institute.

H. The title, name and address of each Local Honorary Secretary shall be printed in the publications of the Institute.

In dealing with the subject before it, and in preparing its report, your Committee has carefully considered the documents and correspondence placed in its hands; particularly the paper of the Secretary on "Monthly Meetings" and the plan for the establishment of chapters of the Institute drawn up by Dr. Emery, both of which were read at the October meeting.

The scheme for local meetings suggested in this report has been designed with the purpose of affording to members, distant from the headquarters of the Institute, opportunity to participate in its work on substantially the same footing as members whose location permits them to attend the meetings held in New York. The Institute is a national body, having members in every section of the country, but with a large preponderance of membership relatively near headquarters. Its work and its publications have a national significance. Its subdivision into sections or chapters would detract from the unity and strength of its efforts to serve the best interests of electrical science and industry.

Your Committee, therefore, is of opinion that it would not be for the welfare of the Institute to create any separate local organizations or any class or classes of members not now provided for in its Rules.

It is believed that the plan for Local Honorary Secretaryships and for local meetings herewith submitted would meet fully the desire of members in diverse parts of the country to participate in the work of the Institute and that it would avoid the disadvantage and disintegrating tendency that might arise from the formal establishment of a number of separate and distinct sub-societies.

HERBERT LAWS WEBB,
Chairman,

A. E. KENNELLY,
M. I. PUPIN,
WM. J. HAMMER,
GEO. M. PHELPS.

} Committee.

Chicago AIEE Members, 1893

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Albright, H. F., 227 S. Clinton St.
Armstrong, Chas. G.

1400 Auditorium Tower.

Arnold Bion J., 1428 Prairie Ave.

Barton, Enos M., 227 South Clinton St.

Bauer, A. H., 310 Pullman Building.

Boggs, Lemuel S., 3012 Groveland Ave.

Brown, C. A., 1430 Monadnock Bldg.

Caldwell, Edward, 1432-3 Monadnock Bldg.

Comstock, L. K., Monadnock Bldg.

Crandall, Chester D., 4438 Ellis Ave.

Cushing, F. W., 1106 The Rookery.

Cutter, George, 851 The Rookery.

DeLand, Fred., 565 The Rookery.

Gutmann, L., Care of *Street Railway Review*,

Haskins, Clark C., 582 W. Congress St.

Hibbard, Angus S., 203 Washington St.

Keller, E. E., 5506 Monroe Ave.

Kreidler, W. A., 6 Lakeside Building.

Insull, Samuel, The Rookery.

Izard, E. M., 61 Clark St.

Lenz, Charles Otto, 2025 Wabash Ave.

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VOL. XXII. NEW YORK, SEPT. 16, 1893. NO. 12.

CONTENTS.

Meeting of Chicago Members of the American Institute of Electrical Engineers.

An informal meeting of members of the American Institute of Electrical Engineers resident in Chicago and vicinity was held Saturday evening, Sept. 2, at the rooms of the Institute in the Electricity Building at the World's Fair. Several other members were present upon invitation, including W. H. Preece, president of the British Institution of Electrical Engineers; George M. Phelps, Dr. N. S. Keith, of San Francisco, and Townsend Wolcott, of Hoosick Falls, N. Y. Secretary Pope called the meeting to order and stated its object to be a simple conference in regard to the desirability of holding occasional meetings in Chicago in order that the 40 members in the city and vicinity might enjoy more of the privileges of the association. He said that this question had been under consideration by the council at different times during the last two years, but that, in the absence of any united expression of opinion on the part of those most directly interested, nothing could be done. He had therefore made the call with the consent of President Houston, and suggested that the meeting proceed to organize by electing a chairman. Edward Caldwell was thereupon elected chairman of the meeting and H. A. Foster, secretary.

Mr. Pope announced that during the last year an offer had been made by the Armour Institute, Chicago, to place at the disposal of the American Institute of Electrical Engineers a suitable room or hall for meeting purposes. At his request Mr. Foster had visited the Armour Institute buildings in company with Prof. Stine, and had reported that the rooms available were suitable in every way.

Prof. Stine said there were two suitable rooms at the Armour Institute that could be used, in either of which all kinds of apparatus were available for experimental purposes, and both alternating and continuous current could be had. There was also a hall seating 2,000, which might be desirable for public lectures. A valuable library was being secured, and technical journals would be found on file.

Dr. Keith said there was now in San Francisco a flourishing electrical society having about 100 members and holding semi-monthly meetings, and that the matter of affiliating this society with the Institute had been considered in San Francisco; the sentiment was favorable, but formal action had been deferred until the opinion of the Institute had been obtained. He considered that the establishment of branches would result in a largely increased membership of the Institute and an increase in the number and value of its papers.

Lieutenant Rodman expressed himself heartily in favor of such a movement as is contemplated, and believed that it would bring about good results.

Clark C. Haskins thought that the proposed plan would evade most of the difficulties which had been encountered in placing local societies on a substantial footing on account of the closer affiliation with an organized national society.

Mr. W. H. Preece referred to the several great English societies, and said that the meetings were not considered of as much value to the members as the published transactions. He advised that every effort should be made to increase the membership without lowering the standard, and that the larger possible proportion of the income should be devoted to printing. By the proper selection of papers to be read he believed the proposed movement would be productive of much good.

After further remarks by Messrs. Arnold, Phelps, Pierce, Wolcott and others, the chairman appointed Messrs. H. A. Foster, B. J. Arnold and R. H. Pierce a committee to canvass Chicago members to ascertain if they were desirous of having Institute meetings held as proposed.

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CORRESPONDENCE relating to electricity, or any of its practical applications, is cordially invited, and the co-operation of all electrical thinkers and workers earnestly desired. Clear, concise, well written articles are especially welcome; and communications, views, news items, local newspaper clippings, or any information likely to interest electricians, will be thankfully received and cheerfully acknowledged.

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WHAT funny fellows the gas men are, to be sure! Here is one who favors the *American Gas Light Journal* with "A Gas Man's Notes at the World's Fair," and were it not for the fact that his literary production appears somewhat inflated by the product that he so laboriously advocates, he might take rank as a humorist of considerable note. After first making the startling statement that "all gas men will probably agree that there was a greater straining after catchy and flashy novelties of illumination and kaleidoscopic advertising than after a steady and a uniformly good quality of practical and much needed internal illumination of the buildings," he proceeds to advance a rather novel proposition for the improvement of Chief Barrett's department, which he sets forth in the following terms:

The quality, quantity and arrangement of many of the exhibits in the electricity building certainly left much to be desired. The thought no doubt occurred to many gas men that a little economy of space and compacting of many loose exhibits there would have given room for a most respectable show of the allied gas industries, instead of their being compelled to isolated loneliness in various other exhibition buildings. A few well arranged rooms, lighted with Welsbach and Lungren gas lamps, would have put to shame many of the boasted classes of incandescent gewgaws shown there.

What a pity that this suggestion was not advanced before the fair closed! What business have "the boasted classes of incandescent gewgaws" in an electrical building anyway? Crowd them in a corner and make way for the superior "Welsbach and Lungren gas lamps." Why were gas motors ignored for electric motors, and why an Edison tower of light when we might have had a gas torch? Why such an illumination of the General Electric company's meter room, for instance, which was merely beautiful and complete, when we might have had nice smoky, oxygen-consuming gas jets spouting from brackets or glimmering on a chandelier? An amazed and injured world pauses for answers to these and similar

questions. It is but too true that the electricity building was used for the exhibition of electrical appliances and was not turned over to the gas men. Alas that human nature is so perverse! But perhaps if this egregious mistake had been pointed out, it might have been set right, to the undying acclaim of him who proclaimed the error.

In the course of his "Notes" the amusing gas man makes several misstatements, such as the assertion that the Schichau engine developed 2,500 horse power, when, as a matter of fact, not half that amount of power was obtained from it. He also states that "in the electricity building the English showed a triple expansion engine, closely connected with a very heavy dynamo." This set was installed in machinery hall, not in electricity building. The writer briefly alludes to the gas engines, coffee boilers and ranges at the fair, and then concludes by rushing off at a tangent with this sapient utterance: "Most gas men, while in Chicago, doubtless noticed the gas motor street railway cars of the North Chicago company gliding smoothly along, without the ugly trolley. What an outlet for increased consumption of gas in our cities, without the trolley nuisance." Yes, indeed! But inasmuch as the chief of police of Chicago has received orders to stop the running of these cars, as the residents along the streets afflicted consider them intolerable nuisances, perhaps the reference was rather unfortunate.

Truly, the gas men are funny fellows.

December 2, 1893

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10

Fair Days: The 1893 World's Columbian Exposition

From the exotic art of belly dancing to the wonders of Ferris wheel rides and moving pictures, the 1893 World's Columbian Exposition held in Chicago introduced a host of new products and experiences so powerful that their influences are felt even today.

Some 27.5 million people — one in every 10 Americans — flocked to Jackson Park between May 1, and October 31, to see the sights that stretched two miles along the shores of Lake Michigan. The event celebrated the 400th anniversary of Christopher Columbus' arrival in the new world and like the adventurer, visitors to the fair were astonished by what they saw. According to some estimates, for fair-goers to have spent just 10 minutes at each of the exhibits would have taken 21 years.

The Exposition's main buildings were constructed under the direction of Daniel Burnham in an ornate, neo-classical style. Designed as temporary

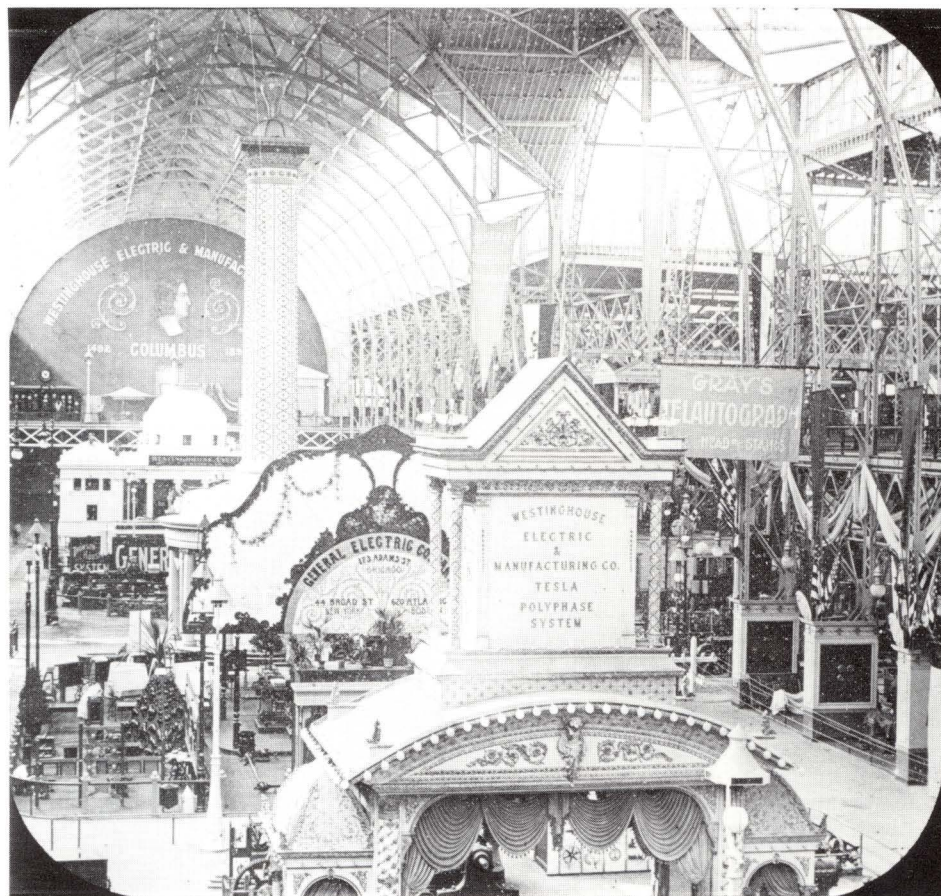
structures, the buildings were created from staff, a mixture of plaster of Paris and hemp, that was polished until it gleamed like marble. The "White City" as it was called, influenced architecture across the country for years to come. Following the fair, hundreds of towns built city halls, libraries and other buildings with tall columns and high narrow windows.

In addition to spectacular architecture, the fair featured buildings dedicated to a dozen major themes including manufacture, agriculture, machinery, mines, transportation and horticulture. The Electricity Building drew throngs of people for demonstrations of artificial lighting, Edison's Kinetoscope and an electrically baked ham.

The Palace of Fine Arts displayed the most comprehensive collection of artwork ever before assembled. (The only surviving structure from the fair,

Fun Facts from the Fair

- First large-scale demonstration of electricity, including the kinetoscope, phonograph, the electric chair and electric cooking
- First movable sidewalk
It was predicted that this device would be the wave of the future, but the "people mover" disappeared with the fair.
- Introduction of Cracker Jack
- First and biggest Ferris wheel
It took George Ferris only 20 minutes to sketch his vision of the giant wheel and the engineering specifications necessary to build it.
 - Up to 60 people could ride in each of the wheel's 36 cars.
 - A single 1,000-horsepower engine drove the wheel.
 - A ride on the Ferris wheel cost 50 cents, 10 times the cost of the merry-go-round, but 92 percent of all visitors took a spin.
- Introduction of the "hootchy-kootchy" or belly dancing
- First dishwasher
Exhibited in the Women's Building, the first dishwasher was designed by Josephine Cochrane and immediately adopted by hotels and restaurants.
- First use of concrete paving
- First side-buttoned lady's boot
- First American picture postcards
Europeans had been sending them for a while, but this was the first chance for Americans.
- Introduction of aspirin
- First use of saccharin



Interior of Electricity Building, World's Columbian Exposition, 1893 — Chicago Historical Society

the Palace of Fine Arts today houses the Museum of Science and Industry's collection.) A Women's Building showcased female inventions and handiwork including the first automatic dishwasher. Nineteen pavilions were prepared by foreign governments and 38 by American states.

Some of the fair's most popular attractions lay just outside the Exposition's grounds on the infamous Midway Plaisance, which was created for recreational diversions. Here the world's first Ferris wheel stretched

four stories tall. Constructed by George Washington Gale Ferris to rival the Eiffel Tower, the wheel had 36 cars that held 60 people each. Ninety-two percent of all fair-goers rode the wheel.

Most visitors also experienced the gyrations and bare midriff of Little Egypt whose movements became better known as the belly dance or hootchy-kootchy. The Midway's dozens of recreated villages also introduced the customs and cuisine of China, Alaska, the South Sea Islands, Germany, Lapland, Turkey, Persia and

other distant lands.

In just six months, the Exposition brought the whole world to Chicago, but it closed in a surprisingly subdued fashion. On the night of October 28, Mayor Carter Harrison addressed cheering crowds at the fairgrounds then returned home to be shot and killed outside his own front door. At the "White City," flags were lowered to half-mast and the orchestra played a funeral march. There was a 21-gun salute at sunset. The Exposition closed quietly on October 31.

History of the Museum of Science & Industry

The eulogies were written. By 1920, the Palace of Fine Arts, the last remaining building of Chicago's 1893 World's Columbian Exposition, faced an uncertain future.

Designed by Charles B. Atwood, the Palace of Fine Arts paid homage to classic Greek architecture and, in sculptor Augustus St. Gaudens' view, was 'the finest thing done since the Parthenon.'

But unlike the Parthenon, the structure was not meant to last. Although more permanent materials such as brick were used to construct the Palace of Fine Arts, it was a temporary structure. Its cost was \$541,795.

From 1894 to 1920, the building was the home of the Field Museum and was kept in condition by occasional patching and repairs. But when the Field Museum moved to its new home in Grant Park, the Palace of Fine Arts was ne-

glected and quickly fell to ruin. The foundation weakened in the wet, sandy soil of Jackson Park and the winds and rain rusted the steel and chipped away at the plaster-covered brick and wood. To some, the building had become only a scaly, wormy pile that should be allowed to die. But most public senti-

ment favored saving the building. The *Chicago Tribune* ran editorials, and the South Park Board, led by an up-and-coming politician named Edward J. Kelly (who later became mayor), reversed its decision to demolish the building. To show that restoration was possible, the Illinois Federation of



Interior of Electricity Building, World's Columbian Exposition, 1893 — Chicago Historical Society

Women's Clubs raised almost \$7,000 in 1922 to renew a corner of the building.

In 1925, members of the Federation held a banquet in the drafty building. And as Genevieve Forbes of the *Chicago Tribune* reported, "the men and women shivered and shook as they basked in the warmth of memories of the Parthenon and dodged the wind that swept through the friezes. Men's white bow ties were hidden by mufflers and overcoat collars. Women's white shoulders were swathed in last year's furs, hauled out of this year's travelling bags."

Clearly, more needed to be done. And a decision had to be made about how to use the building. Sculptor Loreda Taft wanted the building to become a branch of the Art Institute. Others suggested it to be used as an industrial art school or a convention hall.

The city's leaders continued their discussion, unaware that a prominent Chicagoan's trip to Germany more than a decade before was to determine the fate of the building.

Julius Rosenwald was a man of many interests. Chairman of Sears, Roebuck and Company, Rosenwald also was one of America's leading philanthropists.

The range of his philanthropy extended from establishing health services and dental clinics in public schools to financing Admiral Richard E. Byrd's expedition to the South Pole.

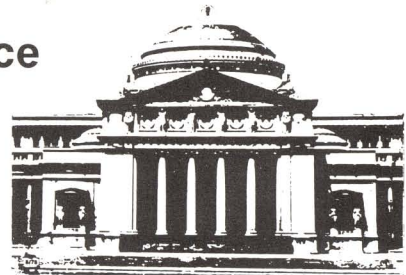
In 1911, Rosenwald had visited the Deutsches Museum in Munich, Germany, with his 8-year-old son. Young William was captivated by a museum where things moved and which encouraged visitors to push buttons and work levers. He urged his father to bring such a museum to Chicago.

In the 1920s, Rosenwald sought and obtained the backing of the influential Commercial Club of Chicago, headed then by Sewell L. Avery, for an "industrial museum." Shortly after pledging \$3 million for the development of the museum, Rosenwald had another idea. The Palace of Fine Arts needed a purpose and the museum needed a home. In 1926, the South Park District passed a \$5 million bond issue for restoration of the building with the understanding that the exterior would look exactly like it did in 1893, while the inside could be adapted for a participatory science and technology museum.



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The R.C. Wieboldt Company was selected to restore the exterior of the building at a cost of more than \$1.6 million.

One more debate was to delay the beginning of the restoration work. Terra cotta versus limestone became an issue which would be played out in one-page ads paid for by terra cotta companies, at Park Board meetings, and in editorials by the *Chicago Tribune*. Finally, it was agreed that Indiana limestone would be used, and a contract was let for 350,000 cubic feet of stone which weighed 28,000 tons.

In 1929, R.C. Wieboldt threw the first brick through a window of the old

building and the reconstruction was officially under way. Two years later Wieboldt personally oversaw the installation of the caryatids and statues over the portals, which he referred to as "the ladies."

The Museum originally was incorporated as the Rosenwald Industrial Museum. But Julius Rosenwald objected, saying that such institutions should belong to the people and not just one man. As a result, the name was changed to Museum of Science and Industry in 1928 — five years before the Museum opened. Eventually the Rosenwald Fund gave some \$7 million to develop the Museum.

Engineering on Display: Chicago and Niagara Falls

In the 1890s, the electrical engineers showed off their new accomplishments and capabilities.

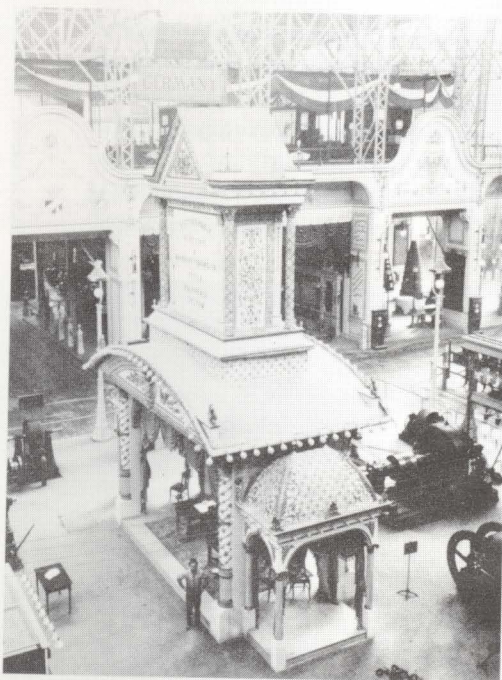
The World's Fair at Chicago and the giant power plant at Niagara Falls displayed what engineers could do.

As the complexity and scale of the new electrical technology continued their accelerating growth at the close of the 19th century, so did electricity's visibility and impact. Nowhere was this more evident than at the two great, though very different, showplaces of American engineering in the 1890s—Chicago and Niagara.

The World's Columbian Exposition at Chicago and the power station constructed at Niagara Falls, New York, were the great stages for displaying how far the electrical engineering profession had come in one short decade. On these stages were acted out not only the triumphs of electrical technology but also the controversies and struggles that accompanied explosive growth.

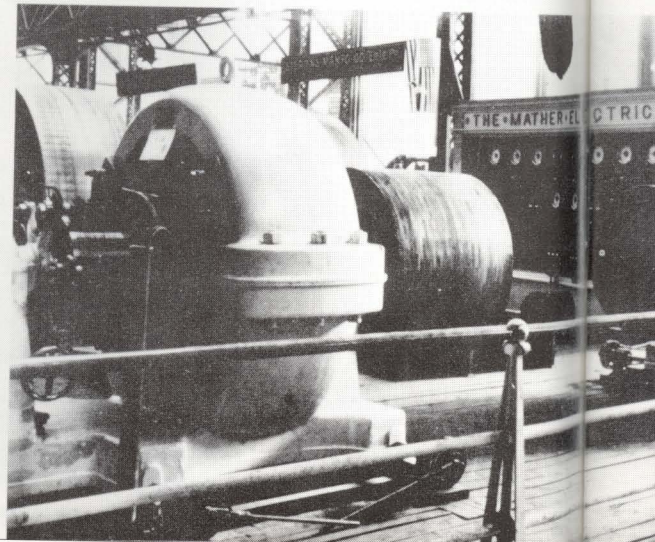
So grand was the World's Fair that opened in Chicago to celebrate the 400th anniversary of Columbus's discovery of America that no one minded that it was a year late. It was the first fair where electricity was given its own building, but the impact of the new technology was in fact spread throughout the "White City" that rose on the shores of Lake Michigan. The lighting, in particular, made an enormous impression on the millions of visitors who poured in from across America and around the world. The 8,000 arc lights and 130,000 incandescent lamps that the Westinghouse Company installed throughout the grounds represented a technical triumph for a manufacturer whom many still considered an upstart in the electric light and power industry. More important than the size of the effort, however, was that it demonstrated the practicality of alternating current systems, which thereafter rapidly eclipsed the direct current technology of Edison and others.

Just as in Philadelphia in 1884, the Chicago exhibition was seen as a good setting for an electrical conference. The resulting Chicago International Electrical Congress was testimony to the growing prestige of American electrical engineering, for this was a truly international meeting that made great strides in establishing the world's standards for fundamental electrical units. Particularly gratifying to the Americans was the adoption of the "henry" as the international unit of inductance—a proposal that had been advanced by the AIEE to honor one of the founders of electrical science in America.



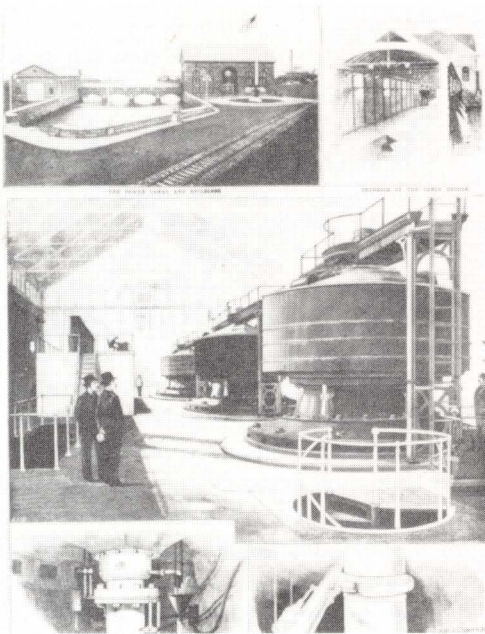
Chicago, 1893

Smithsonian Institution



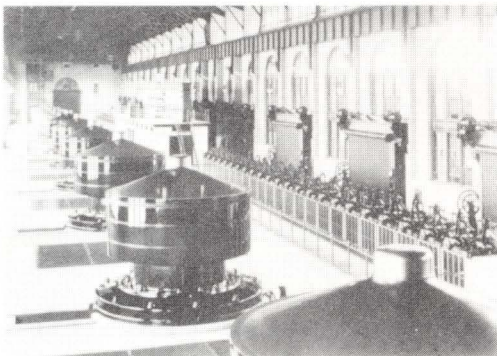
Chicago, 1893

Smithsonian Institution



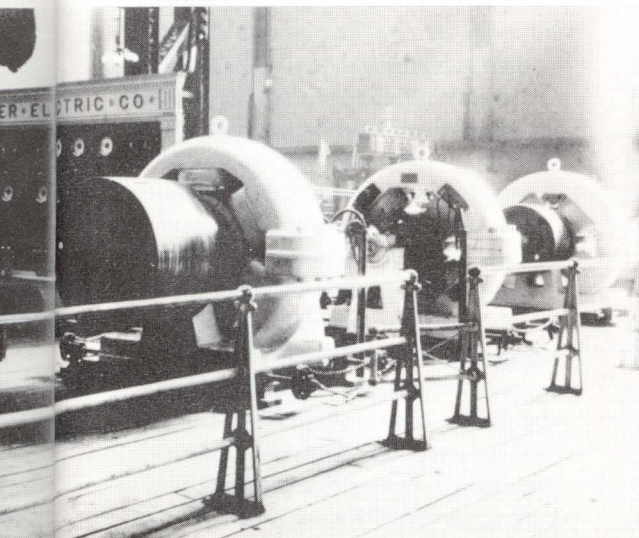
"The Niagara Falls Power Plant"

Smithsonian Institution

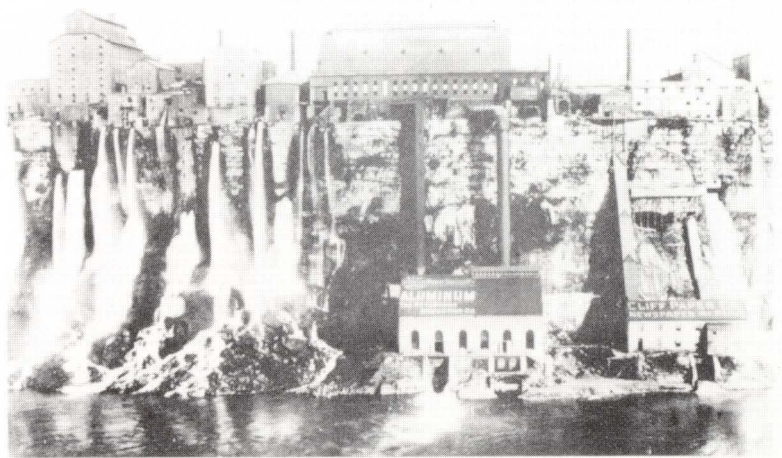


Niagara Falls Power House #2, c. 1905

Smithsonian Institution



Niagara Falls represented a showplace of a very different sort. Here electrical engineers were confronted with one of the great technical challenges of the age—how to harness the enormous power latent in Niagara's thundering waters and make it available for useful work. Years of study and heated debate preceded the start-up of the first Niagara Falls Power Station in the summer of 1895, as engineers and financiers argued about whether electricity could be relied on to transmit large amounts of power the 20 miles to Buffalo and, if so, whether it should be direct or alternating current. The success of the giant polyphase alternating current generators made clear the directions that electric power technology would take in the new century, and the attraction of novel industries that consumed great amounts of electricity, such as aluminum and other electrochemical manufacturers, showed the vast potential for growth and change that electricity held for the future.



Smithsonian Institution

The discovery of how to use electricity to make aluminum in 1886 gave Niagara Falls its first major consumer of power—the Pittsburgh Reduction Company, now known as the Aluminum Company of America (ALCOA)

Chicago Electrical Milestones — Commonwealth Edison Co. History

By John Hogan

Commonwealth Edison Company, which today serves the electrical needs of more than eight million people in northern Illinois, began life in 1887, the creation of Robert Todd Lincoln, son of the late President, and about 40 other leading Chicagoans. A popular misconception holds that the company was founded by Samuel Insull. Actually, it wasn't until 1892 that the British expatriate, who had served for 11 years as Thomas Edison's personal aide, was hired as President of Chicago Edison, as the company was known at that time.

Not a scientist or engineer but a true marketing genius, Insull embraced the gospel of his mentor, Edison, who said, "After this, we will make electric light so cheap that only the rich will be able to burn candles." In 1892, Sam Insull and Chicago Edison both were young, vigorous, full of potential, brimming with ideas, and optimistic about the future. When Insull arrived, he found Chicago Edison only one of more than 20 small electric lighting companies, but that soon would change.

Insull had the good fortune of assuming command of an electric lighting company one year before the use of electricity received its most spectacular boost to that time. The World's Columbian Exposition of 1893 not only provided a dazzling spectacle of illumination but also gave visitors their first look at such modern miracles as flat irons, heating pads, coffee makers, and water heaters. After a trip to the World's Fair, countless numbers were

sold on electric living. Between 1892 and 1895, Chicago Edison's annual sales leaped from 2.8 million to 13.7 million kilowatthours. The company helped ensure that the graph would continue in that direction by cutting rates, creating a professional sales force, then an Advertising Department. Thus began a long-term race to keep electricity supply ahead of demand.

A giant step on the supply side occurred in 1903 with the startup of Edison's Fisk Station, the world's largest central generating plant and the first to implement turbine-generator technology of the then-unheard-of scale of 5,000 kilowatts. The historic plant on Chicago's near south side recently marked its 90th birthday.

Throughout the late 19th and early 20th Centuries, Chicago Edison continued to grow as it acquired a succession of small, isolated power plants. In 1907, it merged with Commonwealth Electric Company to form the Commonwealth Edison Company. Then Insull focused his gaze closer to home—literally—on the area surrounding his Libertyville farm.

In 1910, the Edison chief sought to prove that a single power source — in this instance the power plant at Waukegan — could serve an interconnected number of farms and villages as if they were city neighborhoods. The project, known as the Lake County Experiment, was successful and paved the way for the creation the following year of the Public Service Company of Northern Illinois, which served the suburbs and outlying areas until its merger with Commonwealth Edison in 1953.

The years following World War I

brought a construction boom in generating stations to keep pace with the dizzying climb in electricity demand. Waukegan, Crawford, Calumet, State Line and Powerton—modern coal-fired plants all—went into service. Meanwhile, Americans had a fascinating new gadget to plug into the socket. KYW, Chicago's first radio station and only the second in the country, went on the air in 1921. Built and operated by Commonwealth Edison and Westinghouse, KYW began broadcasting from the 18th floor of the Edison building. The transmitter was on the roof.

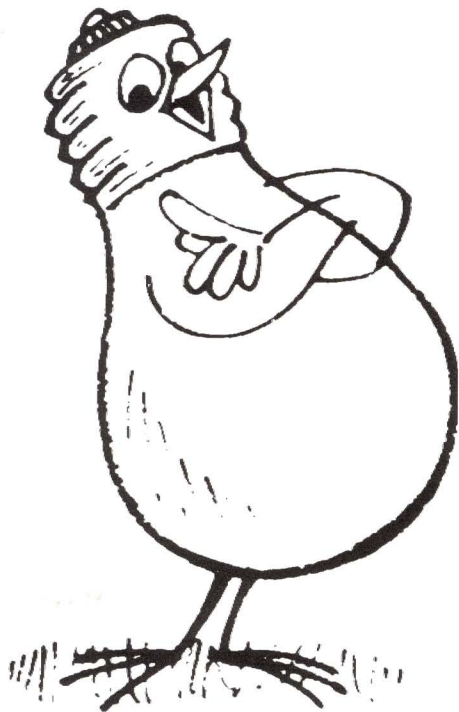
Chicago saw its one-millionth electric meter installed in 1929, not long before the Wall Street crash and the onset of the Great Depression. In the early days of the Depression, electricity sales continued to climb, tailed off for a few years, then bounced back. Sam Insull believed the Depression was only temporary. He continued to borrow money and invest in expansion, but when the New York banks refused to refinance a loan, his holding companies began to collapse. However, Insull's operating companies, including Commonwealth Edison, remained sound throughout the Depression. Insull himself was not so fortunate. He was forced to resign by Edison's Board of Directors in June 1932 and died in the Paris subway six years later.

During the 1930's, Edison embarked on a restructuring program to resurrect itself from the tangle of Insull's collapsed empire. The company unloaded its holdings in a number of non-utility-related enterprises, including the radio station, now known as WENR.

The 1933-34 Century of Progress, held amid the gloom of the Depression, was even more a festival of light than its predecessor, the Columbian Exposition 40 years earlier. From Day One, Edison participated in the planning, construction, financing and operation of the Fair. A first-rate team of Edison lighting engineers made sure the crowds were appropriately dazzled by lamps, searchlights, and neon and



Samuel Insull



mercury vapor tubes, while the Electrical Building showcased the very latest in electrical comforts for the home and workplace.

Before the close of the decade, two new types of entertainment made their debut in Chicago. In the spring of 1939, Edison played host to the first local demonstration of television. That summer, the White Sox played host to the St. Louis Browns—under the lights for the first time.

By 1944, more than 20 percent of Edison's workforce was serving in the military, while back at the company, World War II production drove electricity sales to record highs. During the height of the conflict, the war effort accounted for more than 40 percent of the company's sales.

V-J Day set off a stampede for consumer products which simply were not manufactured during the war. Between 1946 and 1951, electricity consumed by residential users leaped by more than 50 percent. The public snapped up TV sets as quickly as they could be manufactured. Within a two-year period after Chicago's first TV station, WBKB, went on the air in 1946, the number of sets in the area jumped from 1,000 to 140,000.

In the early 1950s, Edison, along with other electric utilities and manufacturers, began investigating the feasibility of generating electricity with atomic power. The way was finally cleared in 1954, when Congress ap-

proved the Atomic Energy Act, which allowed private corporations to build nuclear generating plants. The following year, Edison and General Electric agreed to build a Boiling Water Reactor plant which would become historic Dresden Unit 1, the world's first privately financed commercial nuclear generating station. Dresden 1 went into service in 1960, as a headline in the Chicago Daily News proclaimed, "History is Made in Chicago."

Dresden 2 and 3 and Quad-Cities 1 and 2 followed, cementing Edison's leadership in the nuclear field. After Zion 1 and 2 joined the fleet in the early 1970s, work was begun on six more nuclear units—two each at LaSalle County, Byron, and Braidwood. While they were under construction, conditions began to change markedly. The 1973 oil embargo and subsequent worldwide recession sharply cut demand for electricity. New environmental regulations caused Edison to phase out high sulfur coal use in northern Illinois and replace it with low sulfur coal brought in by train from Wyoming and Montana. The combination of nuclear energy and low sulfur coal enabled Edison to dramatically slash power plant emissions.

The Three Mile Island accident in 1979 shattered nuclear economics, causing a welter of backfits, delays, and regulatory changes that drove up the cost of the six units under construction. Edison persevered. One by one, the units joined the Edison lineup between 1982 and 1988, ultimately lifting the company's nuclear generation to more than 80 percent of the total.

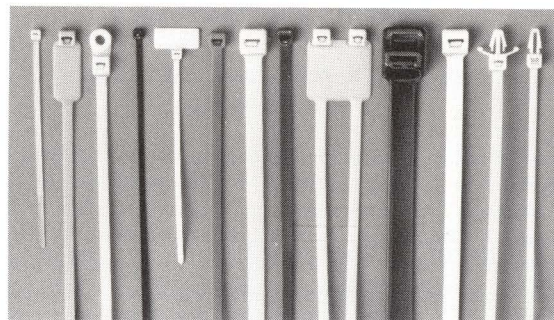
Placing the units in rate base proved a tougher challenge. Nearly a decade of regulatory and judicial uncertainty was concluded in September 1993 when Edison reached a settlement with a num-

ber of parties on all major rate litigation. But five to eight years after beginning service, Byron 2 and Braidwood 1 and 2 were not fully part of the rate base, even though they had performed above expectations.

The settlement allowed the company to focus on new customer initiatives instead of old rate cases. Edison won legislative approval to create a holding company and to form subsidiaries that would provide customers with a range of energy services. This move will allow the company to compete in an increasingly competitive industry. Edison also gave its commercial structure its biggest overhaul in 40 years to promote more effective service to customers.

The twin challenges of the future for electric utilities would seem to be increasing competition and continuing moves toward deregulation. Commonwealth Edison is acting quickly on a variety of fronts to protect its customer base while seeking to take advantage of new business opportunities and technologies.

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Commonwealth Edison

Electrical Engineering at Northwestern University

The charter for Northwestern University was approved by the Illinois State legislature in January of 1851. The first plan for the University, to expand its programs to include civil, mechanical and electrical engineering did not come until forty years later when University President Henry Wade Rogers in his inaugural address of February 18, 1891 called for the establishment of a school for engineering. But it was not until a gift of \$150,000 was received from the Gustav Swift Family that it was possible to construct a building for Engineering. Swift Hall was completed in May 1909, and a program to provide a four year curriculum leading to a Bachelor of Science degree in the three areas of engineering could now be realized. However, in the succeeding years the College of Engineering really operated within the more general curriculum of the College of Liberal Arts. In 1926 following a review of the program, it was decided to strengthen the technical training, and in 1927 the trustees changed the name to the School of Engineering and made it entirely autonomous. In spite of this plan and a fairly steady enrollment in the program during the economic downturn following 1929, it was determined in 1937 that the overall engineering curriculum was still not as intense in engineering subjects as recommended by the Engineering Council for Professional Development. While efforts were being undertaken to address this problem, University President Walter Dill Scott had been informed in 1936 that an unnamed philanthropist wished to endow an existing school of engineering with a substantial gift to create an outstanding engineering program. Ultimately the donor was identified to be the inventor

and manufacturer, Walter P. Murphy who after lengthy negotiations made a initial gift of \$6,735,000 in 1939 for construction of the Technological Institute which was completed in 1942.

Dr. Ovid W. Eshbach was appointed dean of the Technological Institute in 1939 and for the next decade wrestled with the problems of developing an engineering school that would be of the highest caliber, integrate well with the traditional physical sciences, and establish the cooperative educational program with industry. These points had been stressed in the terms of the Murphy endowment, but the

plan for imple-

mentation had not been clearly stated. Another point that had to be addressed was the need to considerably enhance the engineering graduate degree program which in the post World War II era had become a leading indicator for judging the reputation of an engineering school.

To carry out these goals for Electrical Engineering, Dean Eshbach appointed Dr. John Calvert from the Westinghouse Corporation as the first Department Chairman. When Prof. Calvert left the University over a decade later, the Department had made excellent progress toward these objec-

tives. By the late 1950's the technology changes that followed the World War II period had caused some major shifts in the areas being emphasized in both educational and research programs of the Department. Prof. Gordon Murphy was appointed Chairman in 1960 and held that position throughout the 1960's, a period in which further changes were now being strongly influenced by digital electronics and computers.

By 1970 the emerging discipline of Computer Science had evolved to a point where a separate Department was created to expand that activity. Many faculty held joint appointments in both Departments and, as had been the case for several other Universities, in 1977 the two Departments were combined into a single Department of Electrical Engineering and Computer Science



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Robert R. McCormick School of Engineering
and Applied Science

The graduate research in the department covers exciting high-technology areas in all aspects of EECS with special emphasis on information technology in the broad sense. The major areas include: algorithms and computations (including VLSI and high performance computing); artificial intelligence; communications, control, and signal processing (including speech and image processing, intelligent systems and neural networks); computer and information engineering systems (including architecture and distributed data bases); optoelectronic and electronic devices and materials; and optical systems and technology, including optical communications. The department plays a key role in two major centers: The Institute for the Learning Sciences which uses AI in education, and the Center for Quantum Devices which fabricates high performance photonic devices for high-speed applications. All major areas of telecommunications from personal communications systems to multi-media networks are addressed.

Our undergraduate in EE, CS, and Computer Engineering receive individual attention, are able to tailor a variety of programs jointly with other disciplines, and are encouraged towards early involvement in research.

Dept. of EECS, Northwestern University
Evanston, IL 60208-3118 Phone: 708-491-5410

(EE/CS) with Prof. S.S. Yau appointed Chairman. This created the largest Department in engineering and has remained so since that time. In 1988 control specialist, Prof. A.H. Haddad became Chairman and currently continues in that position.

Although a considerable amount of expansion construction and physical changes to the Technological Institute were undertaken since 1942, it was determined by the mid 1980's by the University Administration and Board of Trustees that a major renovation program for the building was needed to prepare for engineering education and research in the 21st century. A 90 million dollar building program was proposed, the largest ever in the history of the University. A significant contribution of 30 million from the Robert R. McCormick Foundation led to the establishment of the McCormick School of Engineering and Applied Science. It

is anticipated that the reconstruction will be completed before the end of the current decade.

The teaching curriculum and research programs in Electrical Engineering & Computer Science have undergone many changes in the past half century. Today the emphasis is in the areas of: Communications, Networks and Control; Intelligent Systems and Signal Processing; Computer and Information Engineering Systems; Microelectronic Devices and Materials; Optical Systems and Technology; Artificial Intelligence; and Algorithms and Computation. Interdisciplinary and collaborative research programs are currently being stressed. Where a significant effort involves several faculty and major funding, the focus of the activity is organized through a research Center. Two such Centers are now associated with the EE/CS Department.

(The above summary was prepared by Prof. C.R. Kannewurf who has been associated with Northwestern University since 1956 and a faculty member of the EE/CS Dept. for over 30 years. He is currently a member of the IEEE Chicago Section Executive Committee. The author wishes to acknowledge the many interesting discussions concerning this history with Prof. James E. Van Ness whose career in Electrical Engineering began at Northwestern in 1949, and has been a member of the EE/CS faculty since 1952, serving as Dept. Chairman from 1969-1972. He is also a Life Fellow of IEEE. The early history of the engineering program was obtained from: Northwestern University A History 1850-1975 by H.F. Williamson and P.S. Wild (Northwestern University, Evanston, IL 1976)).

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Dresden, Pioneer Commercial Nuclear Power Plant

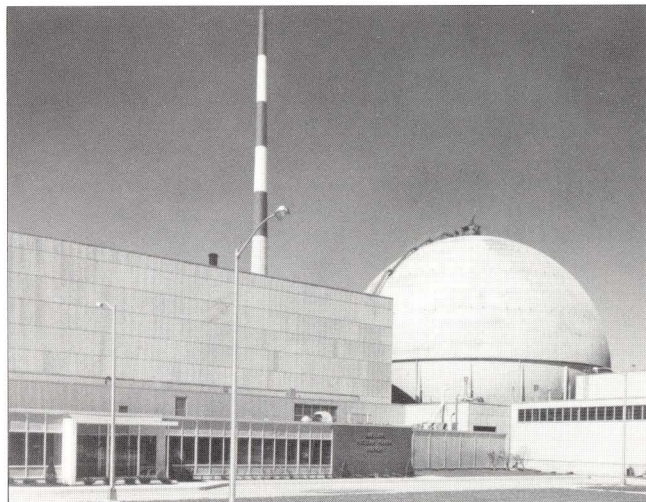
In another power field — nuclear power — action was starting. Authorized in 1955, formal design began the following spring on the 210,000-kilowatt Dresden Nuclear Power Station. Bechtel had been retained as engineer-constructor by General Electric Company, the prime contractor. In part Dresden was an outgrowth of the Nuclear Power Group's studies and the NPG members contributed \$15 million to the project for research and development. G-E wrote a fixed price turnkey contract with the owner, Commonwealth Edison Company of Chicago, for \$45 million — far below the plant's real cost. At this figure the Illinois authorities could approve the project as reasonably near the expenditure required to build a conventional plant of comparable size. Thus, financed entirely through private initiative and cooperation, America's first truly large nuclear power station went into design.

Detail engineering followed and construction started early in 1957. By September, 1959, Bechtel's work was

essentially complete. Dresden reached initial full-rated capacity in the following June and was dedicated on October 12. Representatives of Government, business and science heard the chairman of the U.S. Atomic Energy Commission term it "the largest, most efficient, most advanced" nuclear power plant in the world. The AEC chairman was, in point of interest, John A. McCone, former colleague and onetime president of Bechtel-McCone.

"Dresden did more to establish commercial nuclear power than any other single project," Steve Bechtel has said.

"It set precedent for the utilization of an independent engineer-constructor and established the roles of the owner, engineer-constructor and manufacturer in this type of work. It justified public utility boards in autho-



rizing additional nuclear power plants by pioneering a financial plan that assured competitive power.

"Also, Dresden is often referred to as the most important nuclear power station because of its size and type, and because on this job the plant owner, manufacturer and engineer-constructor developed the high degree of cooperation so essential to good performance on nuclear power projects."

World's Largest Atomic Power Plant To Be Dedicated This Month

*From the Bechtel Brief
October 1960*

Dresden Nuclear Power Station, the largest operating atomic power plant in the world, will be dedicated on Wednesday, October 12, with ceremonies at the plant site on the Illinois Waterway fifty miles southwest of Chicago.

The project was engineered and built during the past four years by Bechtel for General Electric Company, the prime contractor.

Plans for the dedication were announced in Chicago by Willis Gale, chairman of the board of Common-

wealth Edison Company, which will own and operate the plant.

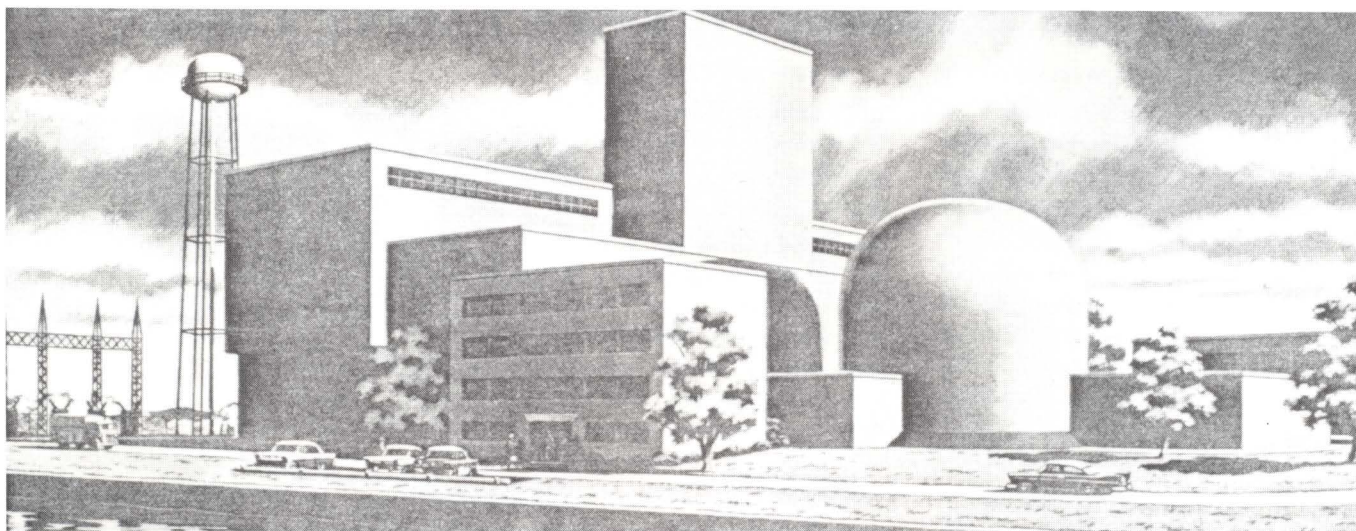
Several hundred guests are expected to attend the ceremonies, including Federal, state and local government officials, business leaders from across the nation and representatives of several foreign countries.

The principal speaker will be John A. McCone, chairman of the U.S. Atomic Energy Commission. Also participating in the program will be Mr. Gale; J. Harris Ward, president of Commonwealth Edison Company; Ralph J. Cordinet, chairman of the board of General Electric Company; S.D. Bechtel, president and board chairman

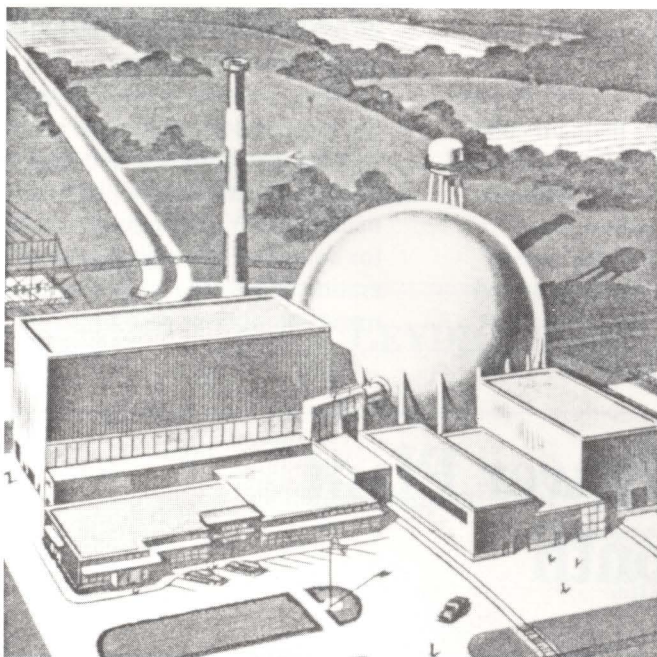
of Bechtel Corporation; William G. Stratton, Governor of Illinois; Mayor Richard J. Daley of Chicago and Congressman Melvin Price of Illinois.

Dresden, which was completed well ahead of the originally scheduled date of December, 1960, is not only the world's largest but also the first full-scale, privately financed nuclear power station in the nation, built entirely without government subsidy. It went into test operation last April 15, producing its first electricity only three years after the start of construction. The station achieved full power on

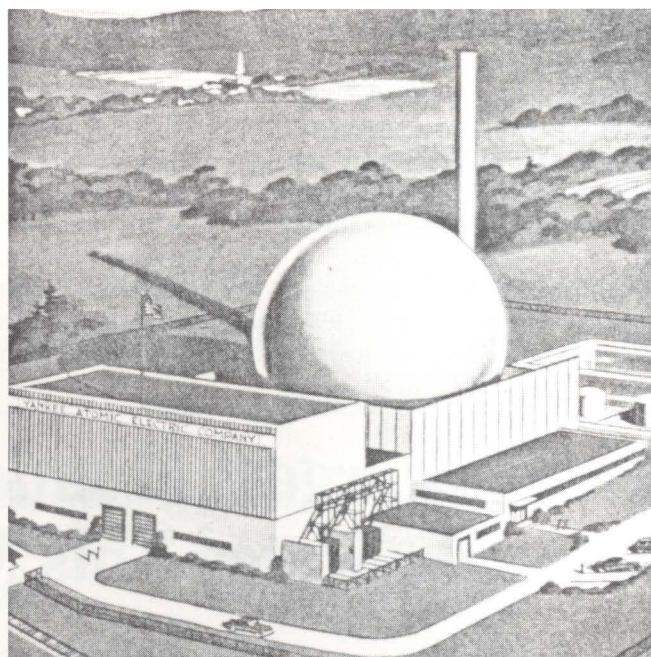
Continued on page 23



Enrico Fermi atomic power plant is under way near Detroit through the joint efforts of 18 electric companies. A group of equipment manufacturers and the Atomic Energy Commission are also associated in the project.



Dresden, Illinois, plant is being developed by 7 electric light and power companies, their equipment manufacturers, and with the co-operation of the AEC.



Yankee atomic-electric plant is being developed by 12 New England electric companies. A number of equipment manufacturers and the AEC are participating.

What will atomic-electric power plants look like?

Among the atomic-electric power plants now under way, three will look like the drawings above when completed.

Although they appear somewhat alike, each involves different methods, different materials, a different type of atomic reactor

or "furnace." That's because the electric companies, the equipment manufacturers and the U. S. Atomic Energy Commission—who are all participating in atomic development—are searching for the best ways to produce electricity, using atomic energy as fuel.

The development of atomic-powered electric plants is the latest stage in bringing plentiful electricity to America. You can be sure that electric company skills and experience, acquired in 75 years of service, are being applied to this great new job.

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* Company names on request through this magazine

Moments From History

Dresden Nuclear Power Station

*From the Bechtel Brief
July 1973*

Looking back at the construction of the Dresden Nuclear Power Station where he was project manager, John Merryman, vice president and manager of Procurement, muses that some of the first-time problems encountered during the building would be merely routine work for Bechtel today.

But when the June, 1957 ground-breaking ceremonies took place for the 180,000-kilowatt plant, it was comparatively early in the history of U.S. commercial nuclear power development.

The Dresden project, located 50 miles south of Chicago in a sparsely populated section of Grundy County, represented a major scaling up in the size of this type of facility. There were many difficulties in obtaining equipment and materials from suppliers who lacked experience in nuclear assignments. Certainly, it was the first time Bechtel engineers had been faced with the demand that their pipework be almost surgically clean to avoid foreign bodies reaching the reactor and becoming radioactive.

There were also other firsts on this project, for which Bechtel performed much of the engineering design and all of the construction for the General Electric Company — the prime contractor for the plant's owner, Commonwealth Edison. At that time it was the first privately financed, all nuclear

commercial power station. It also had the biggest nuclear pressure vessel in the U.S.

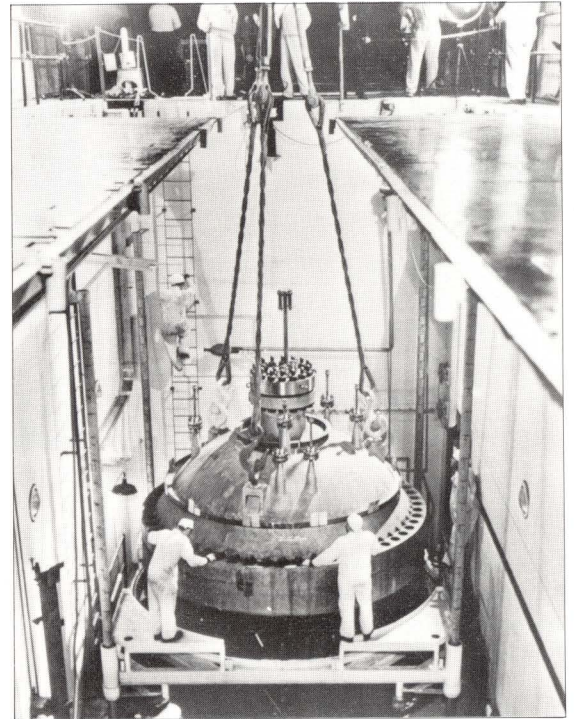
For that period, the transportation of this vessel, a dual-cycle, boiling water reactor weighing 300 tons, was a feat. It stood 42 feet high, and inside its five-inch-thick carbon steel walls it measured 12 feet in diameter. Built at the Camden, New Jersey yard of the New York Shipbuilding Company, it was towed to the Dresden site on a barge via the Atlantic Coast, through the Gulf of Mexico and up the Mississippi and Illinois rivers. The 3,000-odd miles journey took 24 days. But that was not the end of the challenge. A further five days was needed to move the reactor vessel about 3,000 feet from the river bank to the reactor sphere in which it was to be housed.

There was a 1,000-foot gap between the river bank and the existing service road to the site, and the first stage in the transfer operation was to build a linking roadway and to improvise a landing stage. The river bank was excavated so that the barge could be floated adjacent to the new roadway, then the barge was flooded and sunk onto the level, excavated material to keep it steady during the unloading.

Still on the metal skid on which it had traveled, the reactor vessel was inched along on steel rollers riding on two tracks made of I-beams welded together. The hauling was done by a crane mounted on a tractor equipped with a winch-operated dragline.

The vessel was finally lowered into position inside the sphere by a block and tackle operation. The 190 foot-diameter sphere, constructed of more than 3,000 tons of 1-1/2-inch steel plate, was bedded 40 feet below the surface and stood 150 feet above ground.

The reactor vessel circulated water at the rate of 25,600,000 pounds per hour. It was fueled by enriched uranium — a 40-year supply of which was provided by the Atomic Energy Com-



mission. The 66 tons of uranium which was used over a period of six years at Dresden compares favorably with the estimated 3,600,000 tons of coal that would have been burned during that period in a coal-fueled plant of similar size.

Dresden took 4-1/2 years to complete. By September, 1959 Bechtel's job was essentially finished. It was calculated that some 1,350 major drawings had gone into the design.

At the October, 1960 dedication ceremonies the plant was described by John A. McCone, then chairman of AEC, as "the most efficient and most advanced of its type in the world." Then it had the capacity to serve a population of 200,000; by 1963, following authorization from the AEC to increase the heat output from the boiling water reactor, its generators had achieved a record production of some 200,000 kilowatts.

Though technological advances and larger plants may have slightly diminished the original impact of the Dresden facility, it continues to operate successfully well into its second decade.

World's Largest...

Continued from page 21

June 29 and since then has been operating at various levels up to full power.

The 180,000-kilowatt Dresden plant produces enough electricity to meet the needs of a city of more than 200,000 population. Electricity from the plant, which is the same as power from a conventional station, is fed into Commonwealth Edison's interconnected system which ties together the 13 generating plants operated by the big Midwestern utility company.

Bechtel Power Corporation would like to take this opportunity to congratulate the IEEE on its 100th anniversary



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The Power of Responsiveness



Chicago Section Celebrates 100 Years

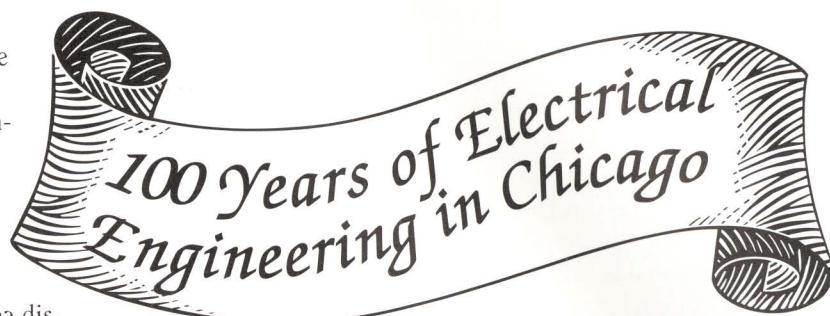
On October 9, 1993, the Museum of Science and Industry (MSI) was the scene for the Centennial Celebration hosted by the Chicago Section of the Institute of Electrical and Electronics Engineers (IEEE). The museum was a fitting location for the celebration since its origin and the Chicago Section's are the same — the World's Columbian Exposition of 1893. The museum, the only permanent structure at the exposition, was known as the Palace of Fine Arts and now remains as the only surviving building from that event. The Chicago Section, the first IEEE section, was formed at the exposition. Linked together in history, the museum opened its doors for after-hours access to approximately 400 guests as they enjoyed a walk into history and a look into tomorrow.

The evening began with a cocktail and hors d'oeuvres reception at the "Building MSI: 1893 to the 21st Century" exhibit in the lower level of the museum. Guests browsed the seven galleries housing over 100 artifacts in the exhibit, each depicting a significant stage in the museum's evolution. Gallery I, "Fun at the Fair", introduced guests to the World's Columbian Exposition. They were encouraged to crank

the handle of a turn-of-the-century dynamo to find out more about the bright-idea discovery of electricity.

In addition to the MSI exhibit, the Chicago Section displayed over twenty historical posters identifying key developments in electricity and electronics over the last 100 years. An active display of World War II communications equipment was demonstrated by Don Helgeson, who was kind enough to stage all his equipment and remain to answer questions from our guests. Many of our members were radio operators or technicians before becoming engineers, and they were able to reminisce their old Signal Corps days. Guests leisurely viewed the displays, mingled with their colleagues and sampled hors d'oeuvres all to the accompaniment of piano music.

The rotunda, where the main dinner was served, was decorated with historical banners from MSI, the Chicago Section, subsections and society chap-



ters. Blue and gold confetti (consistent with IEEE colors) shimmered in the flickering candle light that welcomed the guests to a dinner of prime rib, vegetables, wine and dessert. After dinner, an awards presentation was conducted.

Opening remarks were made by George Thomas, co-chairman, who welcomed the guests and thanked all for their support. Recognition was given to those from region 4 and to the national IEEE representatives that had traveled to Chicago. Gratitude was expressed to the area companies that contributed to the event, as well as members of the Centennial Committee and Veronika Bartkiewicz, the museums' special events director, who facilitated the program. Appreciation was expressed to Vern Albertson, region 4 director, who was instrumental in the Chicago Section receiving Electro Surplus Funds supporting the event and for the publication of the Centennial Book.

George Thomas then introduced Merrill Buckley, past president of the IEEE and current board member. Mr. Buckley spoke on behalf of Martha Sloan, current president of the IEEE. He conveyed the best wishes of all and congratulations on the Section's accomplishments over the last 100 years. Last February in Chicago, Mrs. Sloan made a special presentation to the Chicago Section at the IEEE Honors Ceremonies. George Thomas thanked Mr. Buckley for his kind words and support and then introduced Dennis Lamont, co-chairman of the Centennial Committee, who expressed a gracious welcome to the guests.

Dennis Lamont introduced John Powers, executive director and general manager of the IEEE. Mr. Powers presented Len Cohen, Chicago Section chairman, with a plaque from the IEEE

Electron Devices Society — Chicago Section

The Electron Devices Society (ED) was formally recognized by the Chicago Section as a participating group in section activities in 1980 and held its first meeting in March of that year. This was primarily due to the efforts of Cliff Torbert who served as the first ED Chairman from 1980 to his untimely death in June 1987.

Since 1987, Dr. C.R. Kannewurf (Northwestern University), has served as ED council Chairman. Currently the ED executive council members are Dr. Ron Nordin, (AT & T Bell Labs), Vice

Chairman; Norm Phoenix, Secretary-Treasurer; Dr. Bruce Vojak, (Amoco Technology), Program Chairman; and Mike Banak, (AT & T Bell Labs), Arrangements Chairman. Norm Phoenix has served continuously on the executive council since 1984.



that recognized a century of achievement by the Chicago Section. The Chicago Section has the distinction as the first section ever formed. Len Cohen had in his possession an original ticket from the World's Columbian Exposition that was dated October 9, 1893 — exactly 100 years to the day of our special event. Next, Dennis Lamont introduced Charles Alexander, vice-president, professional activities of the IEEE. Mr. Alexander presented Jon Van, technology editor of the *Chicago Tribune*, with an award. Mr. Van's award was the 1993 United States Activities Board award for distinguished literary contributions furthering public understanding of the profession. Mr. Van gave a brief history of his background and the circle of life events that contributed to his honor that evening. Although Mr. Van is not an engineer by profession, he was always interested in engineering while pursuing a career in journalism.

After the awards presentation, Dennis Lamont introduced John Hogan, assistant secretary of Commonwealth Edison. Mr. Hogan was formerly director of communications services at

Commonwealth Edison and, at one time, was the environmental editor and general assignment reporter at WGN Radio and Television in Chicago. He is the author of the book, *A Spirit Capable*, the 100 year history of Commonwealth Edison. Mr. Hogan spoke about electrical milestones in Chicago's history, including interesting anecdotes of Commonwealth Edison's founder Samuel Insull who was also instrumental in the founding of the Chicago Section.

Following Mr. Hogan's remarks, George Thomas introduced Susan Eleuterio, curator of the "Building MSI: 1893 to the 21st Century" exhibit where the opening reception was held. Mrs. Eleuterio received her masters in American folk culture in museum studies from the State University of New York. She was the collections manager at the Museum of Science and Industry the last three years. Mrs. Eleuterio spoke on the role of electricity at the fair and was able to relate many interesting facets of the fair that were not generally known. The history of the museum itself was fascinating as we learned how Chicago leaders saved

the only remaining structure of the exposition. Her talk reminded us of Chicago's wonderful heritage and of the marvel called the Museum of Science and Industry.

After dinner the guests enjoyed selected exhibits that remained open for their viewing. They could view "Food for Life," "Telecommunications," "Yesterday's Main Street," or return to view "Building MSI." Several of the guests wanted to meet the speakers, and they remained to answer any questions. The hit of the evening was the "Imaging" display that was part of the "Telecommunications" exhibit. Many guests wanted to experience the sensation of virtual reality. Others wanted pictures with their friends, and the photographer accommodated them using the museum's impressive displays as a backdrop for the pictures. People remained at the exhibits until closing time at 11:00 p.m. Then it was time to dim the lights, bid farewell to friends and guests and to add the Centennial Celebration to the list of the Chicago Section's achievements.

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DeVry Keeps Pace with Employers' Needs

For over sixty years, one of DeVry Institute of Technology's primary missions as an educational institution has been to help students prepare for careers in the electronics technology field. DeVry has accomplished this by designing an electronics technology curriculum that keeps pace with employers' needs and the rapid changes in technologies.

DeVry, one of the largest private degree-granting higher education systems in North America, has been able to meet this difficult challenge head on. Through a multi-faceted, ever-evolving curriculum development process, DeVry is continuously updating its electronics technology (baccalaureate and associate degree levels) programs. This relies heavily on a decentralized approach and the continual involvement and interaction of various key parties: employers, alumni, faculty, students and placement directors.

The first step in this process is an industry/technology assessment con-

ducted by the curriculum manager. Looking ahead to the next five to 10 years, the study focuses on emerging technologies and their likely impact on the career paths of program graduates. The assessment takes into account industry journal articles, government forecasts, professional society reports and previous input from alumni and employers.

This is followed by consultations with industry representatives focusing on what competencies they feel are essential for DeVry graduates, both for career entry and advancement. Representative faculty from across the DeVry system also participate.

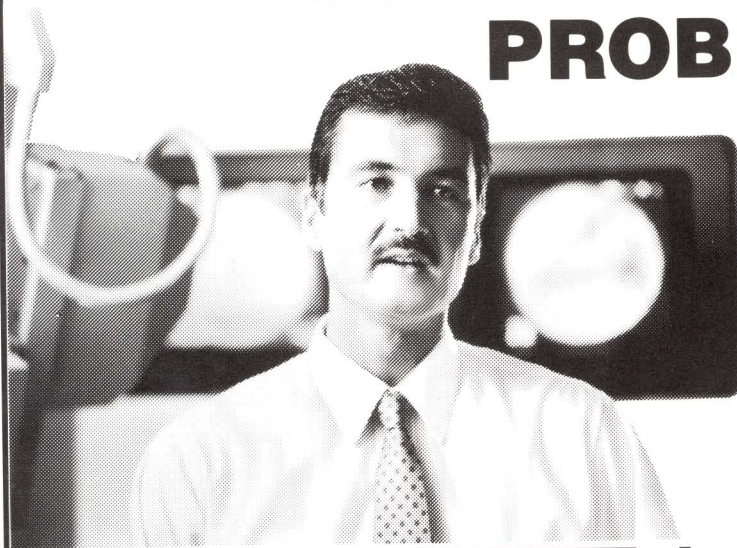
Once the interviewing and consultative sessions are completed and all input and recommendations are compiled, faculty members use their own understanding of sound educational practice to develop a list of broad learning objectives stated in performance terms. Objectives are then clustered to form the basis of courses. Pro-

viding course objectives but allowing for customization of course specifics, such as final textbook selection, gives each instructor the academic freedom to choose his or her own path to achieve those objectives.

The success of DeVry's curriculum development process can be measured, in part, by its impressive employment statistics. Of DeVry's total 1992 graduating class, 91 percent of students who actively pursued employment began a career in their chosen field of study within six months of graduation.

The strength of this process lies in how responsive it is to the need of employers, how well it keeps pace with rapidly changing technology and emerging economic trends and, most importantly, how well it equips graduates for career success. Continual input from all the key players — employers, alumni, faculty, students, placement staff and curriculum managers — ensures that the curriculum development process achieves its goals.

DEVRY GRADUATES ARE PROBLEM SOLVERS.



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**Kevin Hippensteel, GE Medical Systems,
1985 DeVry Graduate**

DeVry Electronics Bachelor's Degree graduates design, develop and troubleshoot microprocessor hardware and software. They provide skilled technical support and training for sophisticated electronics equipment. They solve tough problems for today's companies. DeVry has the right Bachelor's and Associate Degree graduates for your special needs, right now. For more information, contact our local placement office.

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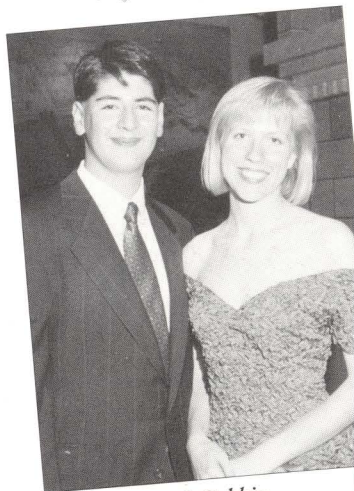
Irwin & Lynda Smiley, Pat & Ardith Murphy



ABOVE: John Conrad (with glasses) in the center
RIGHT: Don, on right, showing his display of early radar and countermeasures equipment



Doug Lattner

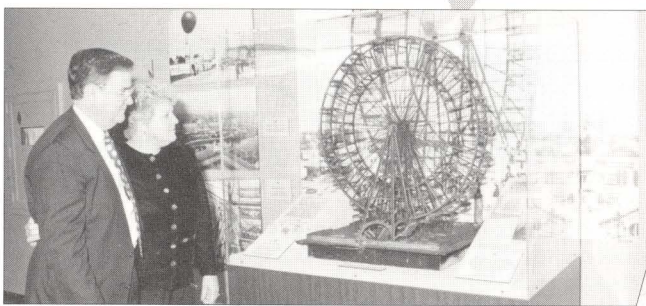


Carlos Rozas & Debbie Shepard

INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS
CHICAGO SECTION
1893 CENTENNIAL CELEBRATION 1993
SATURDAY, OCTOBER 9, 1993
AT
MUSEUM OF SCIENCE AND INDUSTRY

57TH ST. & LAKE SHORE DRIVE
CHICAGO, IL

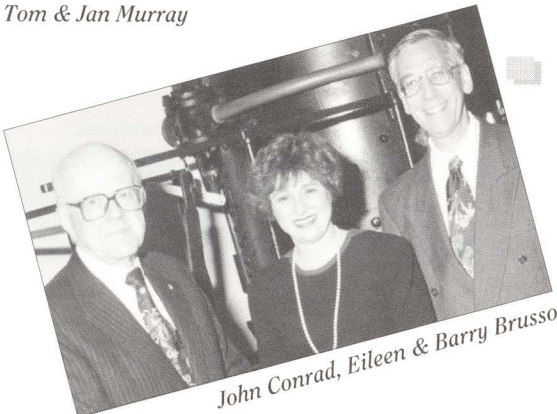
DONATION: \$50.00
COCKTAILS: 6:30 P.M.
DINNER: 7:30 P.M.



Tom & Jan Murray



John & Paula Magagnini



John Conrad, Eileen & Barry Brusso



National, Region 4, Chicago Section Members

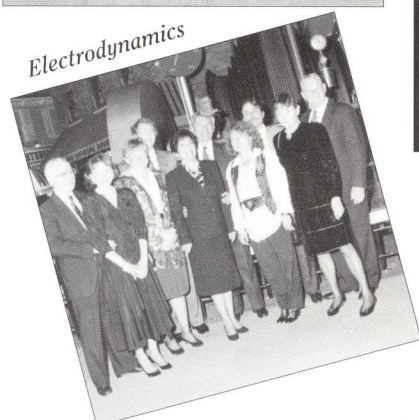


LEFT: Jim Carroll, John Truitt, Howard Wolfman, Dan Vucelich & Barry Brusso

BELOW: University of Illinois at Chicago (UIC), IEEE Student Branch



Electrodynamics



INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS
CHICAGO SECTION



1993

Centennial Celebration



1893

October 9, 1993
Museum of Science and Industry
Chicago, Illinois

Fermi National Accelerator Laboratory,
from left to right: Chris Jensen, Kathy
Champion, Tom Jurgens, Mark
Champion, Ray Yarema, Jim Zagel,
Marcus Larwill, Bob DeMaat, Bob
Trendler, Dave Peterson, Cynthia
Peterson, & Merle Haldeman



LEFT: Bechtel Corporation
(from left to right) John Kovach,
Ginny Kovach, Michael Petz,
Laura Blake, Mark Warren, Kris
Korte, Ron Korte, Mohamad
Hyder, Majid Zargar, Steve
Medanic, Barbara Petz & Sam
Peach



LEFT: Contemporary
Control Systems Inc.

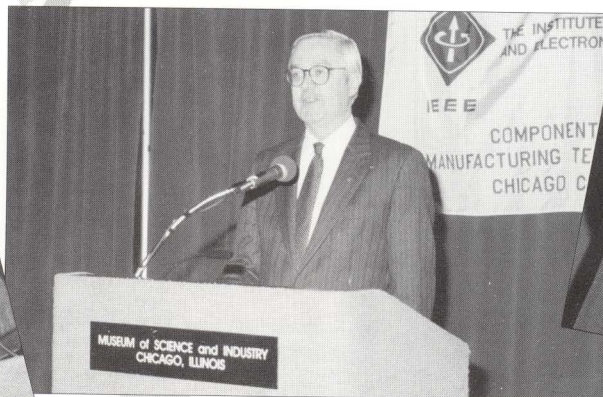
RIGHT: Commonwealth
Edison



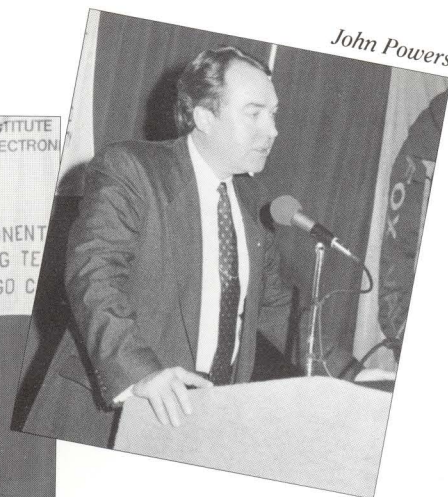
Merrill Buckley



John Hogan



John Powers



PROGRAM

RECEPTION • 6:30-7:30 p.m.

"Building MSI: 1893 to the 21st Century" Exhibit

DINNER • 7:45-8:30 p.m.

In the Rotunda

DINNER PROGRAM • 8:30-9:10 p.m.

Awards Presentation

"Chicago Electrical Milestones"

by

John Hogan, Assistant Secretary of Commonwealth Edison

"Role of Electricity at the Fair"

by

Susan Eleuterio, Past Curator of the Building MSI Exhibit

EVENING PROGRAM • 9:10-11:00 p.m.

Exhibits to be Viewed at Your Leisure

"Telecommunications"

"Food for Life"

"Yesterday's Main Street"

"Building MSI: 1893 to the 21st Century"

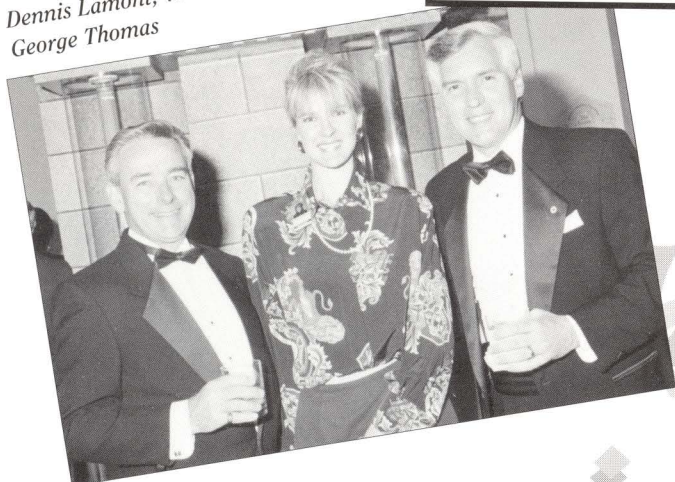
George Thomas



Dennis Lamont



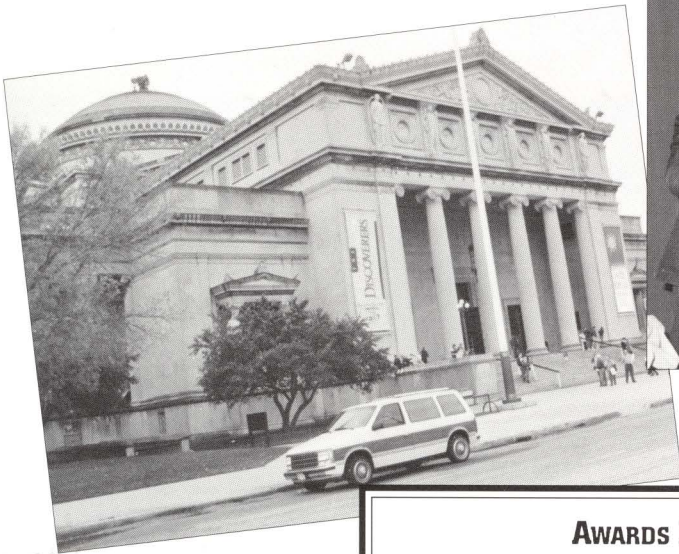
Dennis Lamont, Veronika Bartkiewicz & George Thomas



Sue Eleuterio

John Hogan & wife Judith Brady, John Conrad





Len Cohen & John Powers



AWARDS PRESENTATION

A Century of Achievements

presented to
Len Cohen
Chairman of the Chicago Section

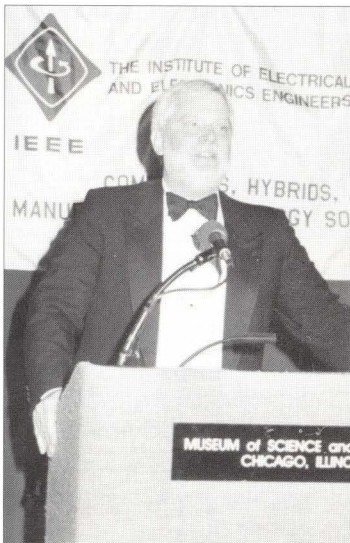
by
John Powers
Executive Director and General Manager
Institute of Electrical and Electronics Engineers, Inc.

*1993 IEEE United States Activities Board Award
for Distinguished Literary Contributions
Furthering Public Understanding
of the Profession*

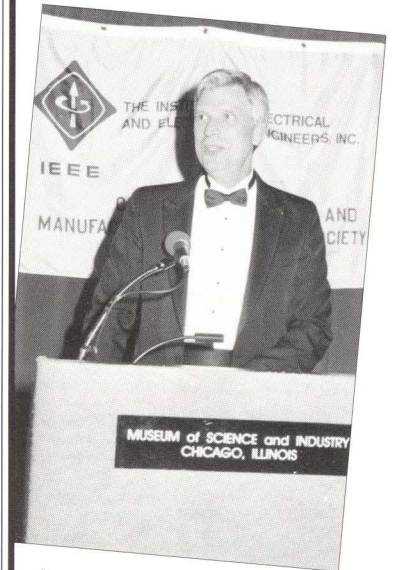
presented to
Jon Van
Technology Editor, *Chicago Tribune*

by
Charles Alexander
Vice President, Professional Activities
Institute of Electrical and Electronics Engineers, Inc.

Jon Van



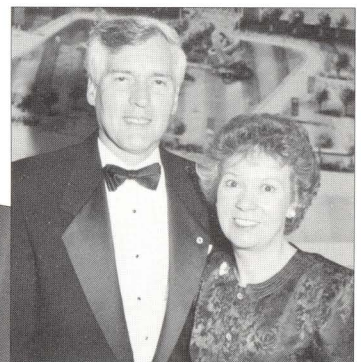
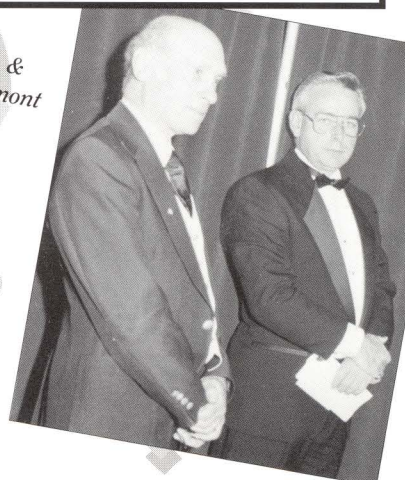
Charles Alexander



Charles Alexander, Jon Van, Denise Van & Howard Wolfman



Len Cohen & Dennis Lamont



George & Judith Thomas

Tellabs: Faith in Engineering

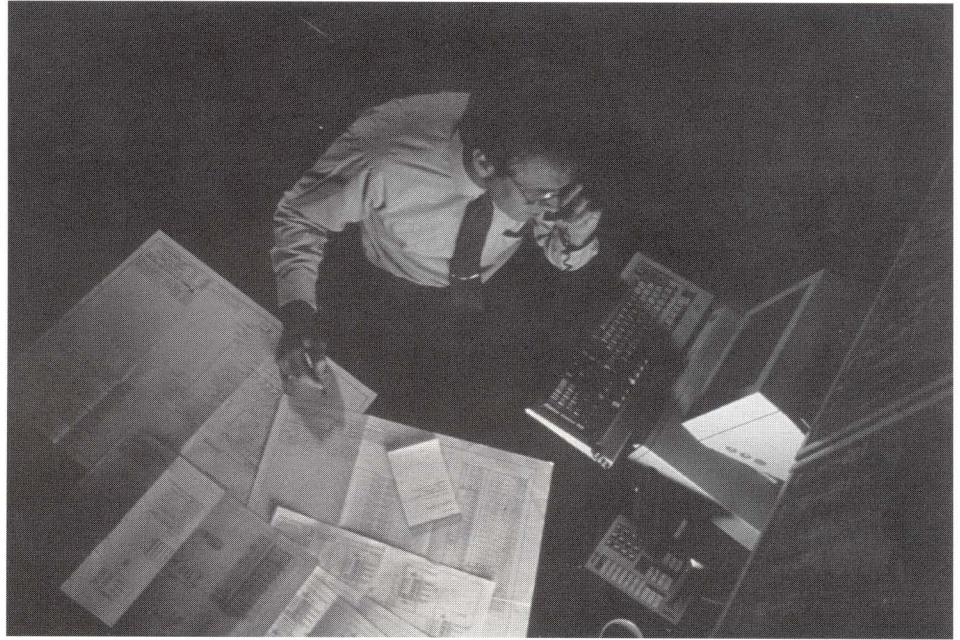
The world of engineering is precise, concrete, reality-based. But the public accepts all the benefits that engineering has brought as a matter of faith: Motorists expect the bridge to support their cars. Telephone calls — whether to Tinley Park or Timbuktu — are routinely expected to go through. All of the acronyms — from ACDs to VCRs — are expected to work.

The public is not alone. Tellabs also has faith in engineering. That's why we salute the IEEE for its 100 years of service to our industry.

Engineering is the backbone upon which we have built our business — a leading manufacturer of voice and data telecommunications equipment. Tellabs' commitment to engineering is inherent in our mission: to be a leading multinational company engaged in developing, producing and marketing advanced network products of the highest quality for the communication industry worldwide.

This commitment to engineering runs through Tellabs:

- President Mike Birck and many senior executives are engineers, and they're in good company. Tellabs' engineers represent one of the largest corporate memberships of the IEEE Chicago chapter.
- Our new \$18-million research and



Expertise in a variety of engineering fields is the key to achieving our corporate vision — world-class performance through process excellence.

manufacturing plant in Bolingbrook is state-of-the-art engineering.

- Tellabs is unusual for a company of its size in that it maintains a separate research center devoted to high-level theoretical research in the telecommunication field.
- A special report in Business Week ranks Tellabs number 2 among telecommunications companies in terms of research and development



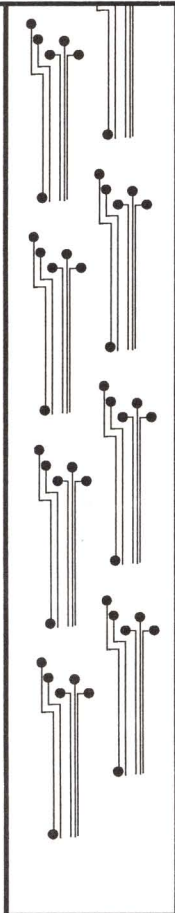
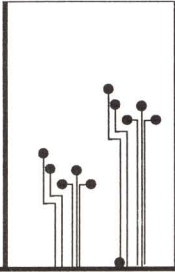
Our new 70,000-square-foot manufacturing facility in Bolingbrook features leading edge surface-mount capabilities.

expenditures as a percentage of 1992 sales — 16.4 percent. Last year, Tellabs spent an average of \$19,163 per employee on R&D — compared with an industry average of \$5,768.

- Our TITAN® 5500 digital cross-connect system, the most ambitious and costly project in the company's history, represents a \$20-million R&D investment. Does this commitment to engineering excellence pay off?
- Tellabs earning for the first half of 1993 came to \$10.4 million on sales of \$136.2. Compare this with earnings of \$16.9 million of \$258.6 million in sales for all of 1992.
- Our TITAN system alone accounted for \$40 million in 1992 and is expected to top \$70 million in 1993.
- Tellabs plans to grow in the international arena where our sales have surged from \$7 million in 1988 to \$52 million in 1992.
- Since Jan. 1, 1993, Tellabs stock has climbed from \$24.75 a share to more than \$60 a share.

In a rapidly changing telecommunications industry, Tellabs is a company engineered for success.

Thanks, IEEE.



Tellabs
Salutes the
IEEE Chicago Section
for 100 Years of Service
to the Engineering Profession

IEEE Chicago Section

— Life Fellows —

YEAR CITATION

J. Paul Clayton	1936	AIEE Fellow
Frank V. Smith	1948	AIEE Fellow
Leonard R. Janes	1949	AIEE Fellow
Charles F. Folliott	1950	AIEE Fellow
Leonard L. Ruggles	1950	AIEE Fellow
Robed Adler	1951	FM radio and Electromechanical
Francis A. Co	1951	AIEE Fellow
Lester B. Le Vesconte	1951	AIEE Fellow
Earle Wild	1951	AIEE Fellow
Marvin Camras	1952	Magnetic recording
Carl P. Clare	1952	AIEE Fellow
Raymond D. Maxson	1955	AIEE Fellow
Ernest L. Michelson	1955	AIEE Fellow, Power System Engineering
Joseph W. Rittenhouse	1961	AIEE- Eng'g education & vacuum switching
Franklin F. Offner	1966	Biomedical Engineering & instrumentation
William J. Weisz	1966	Land Mobile Radio Spectrum Utilization
A. Cottsworth III	1967	Radio and Television receivers
Ludwig F. Lischer	1967	Power Transmission Systems
Gordon J. Murphy	1967	Education and Automatic Control
Richarg F. Yang	1967	Polycrystalline device physics
C. Russell Cox	1969	Antennas & Transmission Lines
James B. Owens	1969	Circuit protection & Standards
H. Baron Whitaker	1969	Electrical equipment safety standards
John J. Staunton	1970	Electro-optics for chemical & clinical analyses
Constantin S. Szegho	1972	Cathode ray devices
Jack E. Bridges	1974	RF interference control
Carl G. Eilers	1977	FM Stereo
Edward F. Koncel	1977	Electric utilities and nuclear fuel
George L. Landgren	1982	Generator stability and Reliability
James E. Van Ness	1982	Computer analysis of power systems
Warren H. Cook	1986	NFPA Standards
Paul K. Giloth	1988	Toil Digital Switching
Robert H. Harner	1988	High Voltage Power Systems
S. David Hoffman	1989	Product safety and standardization
Albert H. Rubenstein	1992	Management of research & development

— Prepared by Jack Sherman

IEEE Chicago Section

— Fellows —

YEAR CITATION

Norman W Parker	1974	Color television receivers
Herbery Y. Chang	1976	Fault tolerant computing
Wai-Kai Chen	1977	Graph and network theory
James L Melsa	1978	Information and control sciences
Werner Ulrich	1979	Telephone electronic switching systems
Joel S. Engel	1980	Cellular mobile telephone systems
Peter J. Dallos	1981	Understanding of the peripheral auditory system
Richard J. Jaeger	1981	Operator assisted telephone switching systems
Abraham H. Haddad	1982	Analysis of stochastic systems
J.J. Mikulski	1983	Cellular mobile radiotelephone systems
Wolfgang. M. Boerner	1984	Doppler radar polarimetry
Daniel Graupe	1985	Application of adaptive filtering to prosthetics
Tadao Murata	1985	Circuit system theory - Petri nets and related models
Martin A. Plonus	1985	Turbulent atmosphere
Gyan Chand Agarwal	1986	Modeling of human motor system
Robert D. Burnham	1986	Fabrication of high performance semiconductors
Shi-Kuo Chang	1986	Pictorial information processing
James C. Lin	1986	Effects of pulsed microwaves on the human inner ear
Frank G. Splitt	1986	Electromagnetic interference protection
Bruce R. Demaeyer	1987	Implementation of major electronic switching systems
Charles M. Knop	1987	Microwave antennas for satellite communication
Michael G. Strauss	1987	Nuclear instrumentation and measurement
Robert C. Arzbaecher	1988	Contributions to electrocardiology
Charles K. Rhodes	1989	High-power short-pulsed lasers
Henry Stark	1989	Reconstruction of medical images from limited data
Allen Tarlove	1990	Finite difference time-domain numerical solutions
P.L.E. Uslenghi	1990	Electromagnetic scattering theory
Barry N. Feinberg	1991	Electrical engineering in medicine
Gerald L. Gottlieb	1991	Neuromuscular control system modeling
Mauro J. Walker	1991	Manufacturing technology for electronic packages
Der-Tsai Lee	1992	Computational geometry
Miron Abromovici	1993	Fault simulation algorithms for VSLI circuits

— Prepared by Jack Sherman

Motorola — Chicago Landmark

In 1928 Paul V. Galvin and his brother, Joseph (1899-1944), purchased a bankrupt storage battery company in Chicago and founded the Galvin Manufacturing Corporation. The fledgling radio company had five employees (the first week's payroll was \$63.00) and initial assets of \$565 in cash and \$750 in tools, plans, and a design for a battery eliminator.

In 1930 Galvin Manufacturing introduced the first commercially successful automobile radio, and the company coined the brand name Motorola, a word suggesting sound in motion. During this decade the company established a line of consumer home radios, entered the new market for police radio communications equipment, and inaugurated pioneering personnel programs.

In the 1940s Galvin Manufacturing was a key supplier of portable communications to the government. Later at the behest of chief scientist and engineer Daniel E. Noble (1902-1980), the company opened a research laboratory

in Phoenix, Arizona, to explore the new field of solid state electronics. By 1947 the Motorola trademark was so widely accepted that the company changed its name from Galvin Manufacturing Corporation to Motorola, Inc.

In the following 30 years Motorola became the principal supplier of radio communications products to commercial and government customers, as well as a world leader in the fast growing semiconductor industry. It also became a strong contender in the fiercely competitive consumer electronics industry, but in 1974 the company ended its involvement in this area. Motorola would now focus exclusively on the development and manufacture of advanced semiconductors, and on wireless communications and information systems and equipment.

Today, Motorola is a leading provider of electronic equipment, systems, components, and services for worldwide markets. It ranks among the top 50 industrial companies in the United States and has more than 100,000 em-

ployees worldwide. Products include two-way radios, pagers, personal communications systems, cellular telephones and systems, discrete semiconductors and integrated circuits, defense and aerospace electronics, automotive and industrial electronics, computers, data communications and information processing and handling equipment.

Robert W. Galvin, Paul Galvin's son, and Christopher B. Galvin, Paul Galvin's grandson play an important role in guiding the company along the paths started by the founders.

Robert W. Galvin was elected an Honorary Member of the IEEE in February 1993. William Weisz, past CEO and present vice-chairman of the Board of Directors is a Life Fellow. There are approximately 400 IEEE Chicago Section members who are Motorola employees. IEEE student members are frequent visitors at the Motorola Museum of Electronics and tour the manufacturing facilities. IEEE technical meetings are held frequently.



MOTOROLA

CORPORATE RESEARCH & DEVELOPMENT

COMMENDS

THE IEEE CHICAGO SECTION

1893 - 1993

CENTENNIAL

MIDCON – Our Electronics Trade Show

You may have noticed that the section received funding support for our centennial from Electro Surplus Funds. Electro is a trade show that alternates each year between New York and Boston. The show has been very successful, and the board of directors of the show have set aside surplus funds for worthy activities such as ours. At one time, our section benefitted directly from a trade show called MIDCON—Mid Continental Electronics Show and Convention.

The first MIDCON was held November 1977 in Chicago. The show was patterned after two highly successful shows — WESCON on the west coast and Electro on the east. MIDCON was the mid-continental version of the show and was to alternate between Dallas and Chicago on a yearly basis. Other regional shows were attempted after MIDCON with similar formats including NORTHCON, SOUTHCON, OHMCON and INDYCON.

People from our section, who were instrumental in launching MIDCON, included David Pivan, the first Board chairman; Paul Carroll, first Show Di-

rector; and Howard Wolfman, first Conference Director. Soon afterwards Jim Ralston joined the board.

The show was managed by Electronic Convention Management (ECM) located in Los Angeles, California, which also managed WESCON, Electro and the other “CON” shows. Although they provided a professional staff, MIDCON relied heavily upon volunteers, many of which came from IEEE affiliations. Several committees were established including attendance, host, reception, life member and registration.

MIDCON had a large board of directors (12) representing the interests of the two show sponsors — IEEE and the Electronics Representatives Association (ERA). Each group was allocated six board seats. The IEEE sponsors were Regions 4 and 5 and the Chicago and Dallas Sections. Each section provided two board seats and the region one each. From the board, posi-

tions of Chairman of the Board, Chairman of the Executive Committee, Show Director and Conference Director were filled. ERA people were responsible for the show and IEEE people for the conference.

Terms on the board usually lasted four years, and new IEEE members replaced retiring board members. Other representatives from both Region 4 and the Chicago Section included Paul Jahn, John Lightner, George Thomas, Dr. Andre Vacroux and John Waters.

The first MIDCON show in Chicago sold about 200 booths, but the shows continued to grow to a peak of 890 booths, thereby becoming an excellent funding vehicle for the Chicago Section. However, the show began to decline with the recession in the late 80's and the reduced interest in broad-based (horizontal) shows such as MIDCON. The last MIDCON was held in Dallas 1990 ending for now the section's involvement in show sponsorship.



Marvin Camras, Prolific Inventor

Marvin Camras, IEEE life fellow and member of the Chicago Section, holds over 500 patents. In 1985, he was inducted into the National Inventors Hall of Fame as the “Father of Magnetic Recording.” He has published more than 40 papers and authored two books. In 1990, he received the National Medal of Technology from president George Bush. In 1992, he received the Coors American Ingenuity Award by Joe Coors, Jr., president, Coors Ceramics Company, in a ceremony in Washington D.C.

Camras has spent more than 50 years at the Illinois Institute of Technology (IIT) and its research arm as a student, researcher and teacher. He currently teaches courses in IIT's electrical and computer engineering

department.

In endorsing Camras for the Coors award, Robert A. Pritzker, chairman of the IIT board of trustees and president and chief executive officer of The Marmon Group Inc., stated, “It's difficult to imagine where we would be today without the benefit of Dr. Camras' work. Magnetic tape recording is one of the most significant discoveries of 20th century technology.”

Camras developed magnetic recording in the late '30s while still a student at Armour Institute of Technology (now IIT). He was determined to find an inexpensive way to record his cousin's singing.



Marvin Camras receives the National Medal of Technology from President George Bush as Mrs. Barbara Bush looks on.

Camras' achievement was turning what had previously been only a concept into a workable product, the wire recorder. His wire recorder used a revolutionary magnetic recording head to

magnetize impressions all around the wire, enabling clear playback. "The first recording I made," said Camras, "I was whistling 'Yankee Doodle.' I rewound the wire and I could hear some sounds coming back from the wire. But when I played it forward again there was nothing.

"It took a week or so to figure out what had happened," Camras continued. "The head was magnetized and while I was rewinding it, it was removing the recording from the wire. I demagnetized the head and then I found it came through loud and clear in the forward direction."

Camras' professors were intrigued by the device and Camras followed their suggestion to join the research arm of the school upon graduation. He

received a patent for the recorder in the early '40s. While World War II caused him to suspend his plans to produce a low-cost home recorder, early wire recorders were used by the Navy to train sailors in anti-submarine

warfare, by the Air Corps to train pilots, and by the Army during the Allied Invasion of Europe to provide decoy sound effects to confuse the enemy.

The wire recorder entered the consumer market shortly after the war. Camras considers his most important invention the development of

magnetic tape, made from a ferric oxide compound. This invention made possible modern tape recording and made obsolete Camras' own invention of the wire recorder. Although the wire

recorder was on the market for many years, tape was easier to handle and made feasible stereo recording.

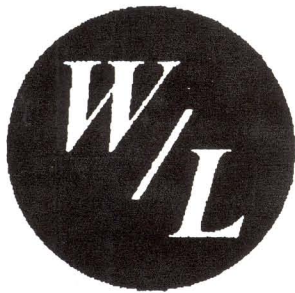
"I came up with an advantageous coating that could be put onto tape," Camras said. "I didn't think it would last very long without improvement, but they're using the same materials almost 50 years later."

Besides audiotape applications, his magnetic coatings are used in videotape, floppy disks and computer tape. His patents include the discovery of high-frequency bias, and the development of stereo tape recording, magnetic sound for motion pictures, videotape recorders and stereophonic sound reproduction. These patents have been licensed to more than 100 companies, including GE, Ampex, Wollensak, 3M, Kodak and Sony.

Camras continues to contribute to the business world by teaching a new generation of engineers at IIT. Said Camras, "I like to have younger people carry on and do some of the engineering our country needs."

"I like to have younger people carry on and do some of the engineering our country needs."

***— Marvin Camras
"The Father of Magnetic Recording"***



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The Microprocessor Spawns Another Company

Contemporary Control Systems, Inc. (CCSI) was founded in 1975 as a consulting and design practice recognizing that the newly introduced microprocessor was destined to replace solid-state logic systems. To prove our premise, we designed a computing ratiometer that could make high resolution draw measurements on a non-woven web process line. The trick was to make the calculation every second at very low speeds, so we chose to make the calculation in software with a \$360 8080 microprocessor, instead of solid-state logic which would have required 100 chips.

Software development tools were crude at the time, and we relied upon an ASR 33 teletype with its paper tape reader/punch for program storage and system console. The equipment was built and tested at the customer's plant meeting the requirements of the project. This success sparked our imagination, and we developed a series of bus boards so that we could address future diverse applications with a

building block approach, thereby saving hardware development time.

In the late 70s, we converted these proprietary designs to the STD BUS—an early bus board standard. We also became active in the STD MG—STD BUS Manufacturer's Group and their successful effort to achieve IEEE 961 recognition of the STD BUS standard.

With the focus on the STD BUS, our company migrated away from consulting to become a manufacturer. Since then the company has pursued many applications in the information, medical, instrumentation and control fields. Our computers were used in diesel engine controls, guiding printing webs, cutoff registration, production monitoring, text editing, electrostimulation, biofeedback and data communications.

In 1982 we developed the hardware for a networked microcomputer system used in a pre-press application for newspapers. This equipment replaced DEC PDP-8 and PDP-11 computers demonstrating the viability of networked microcomputers as a competi-

tor to traditional minicomputers. The network we chose was ARCNET.

In the mid-80s, the personal computer trend replaced our STD BUS microcomputers, and we decided to concentrate on ARCNET since this technology was ideally suited for industrial real time networks. We were instrumental in developing the ARCNET Trade Association (ATA) which develops standards for the large installed base of ARCNET users. Our company markets a complete line of ARCNET equipment, including active hubs and network interface modules which are used in motor drives, HVAC controllers and data acquisition systems.

We had no idea that the microprocessor would have led us to the product line we are currently pursuing, but our basic premise for starting the company was correct. We still rely upon technical innovation to expand our business, but it's the dedicated people at CCSI that deserve the credit for the company's success.



**Contemporary
Control Systems, Inc.**

***Congratulates the IEEE Chicago Section
in their Centennial Year***

Networking and Control Systems for Industry

2512 Wisconsin Avenue, Downers Grove, Illinois 60515
TEL 708.963.7070 FAX 708.963.0109

More Than A Mark

Some things just don't go together: water and electricity or, in 1893, Chicago's Great Columbian Exposition and the electric light bulb. Few have experienced the latter truism as dramatically as electrical investigator William Henry Merrill.

A concerned Chicago Board of Fire Underwriters sent for Merrill to investigate the fires that erupted in the Palace of Electricity during the exposition. Merrill's investigations opened his eyes to a myriad of new needs and possibilities in public safety. Backed by the insurance industry, Merrill took over a spare room at a Chicago fire station, and there conducted the first scientific evaluation of an electrical insulating material in 1894.

From this modest beginning a century ago, Underwriters Laboratories Inc. has grown into the premier product safety certification organization in the United States. UL now tests over 70,000 products in over 3,000 product categories annually.

As the leading developer of U.S. product safety standards, UL participates internationally in the harmonization of national and international product safety standards used in countries around the world.

UL also conducts safety research that helps the electrical and electronics industry, as well as a broad range of other constituents, understand and address new safety concerns in a constantly changing world. A key example of this research was a project UL conducted in 1992 under sponsorship by the National Electrical Manufacturers Association.

UL engineers analyzed the visibility of directional indicators on exit signs. This helped UL to identify specific designs that will meet recently updated national egress codes without the need for extensive product testing. This kind of research work often leads to new or revised UL Standards for Safety and installation codes, or to new test programs and adjunct services for indus-

try. This is just one of the ways in which the work UL does to fulfill its safety mission ultimately benefits all of its constituents.

UL knows global access is as fundamental to success in today's competitive marketplace as water is to life. UL's subsidiaries operate laboratories in Hong Kong and Taiwan for constituents who intend to sell products in the United States. In addition, international engineering service is also provided by UL engineers in Tokyo, the Netherlands and Germany.

UL was established, and has been sustained, by people with a profound commitment to public safety. Their collective experience — nearly a century of testing products and developing Safety Standards — has resulted in versatility and expertise that is unparalleled in the safety certification field. This commitment and experience has created a vision that will continue to provide leadership in public safety through all of the changes that the future will bring.

Some things just go together: UL and safety.

Centennial Congratulations to the IEEE Chicago Section



SARGENT & LUNDY
ENGINEERS

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Chicago, IL 60603
Phone: (312) 260-2000
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Frederick Sargent (far left) and Ayres Lundy (seated at desk) in their office in 1893, shortly after Sargent finished serving as manager of the mechanical and electrical departments for the World's Columbian Exposition.

Engineering innovations for power, electrical distribution, and industry since 1891.



IEEE

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Congratulations IEEE for one hundred

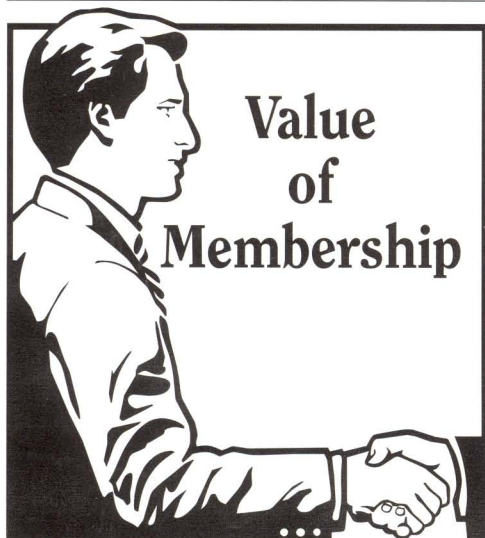
years of electrical and electronics engineering expertise.

As the "American Mark of Safety" for nearly a century,

UL appreciates your efforts in helping to develop

safer products.





By a rewarded member

As a CEO, I frequently receive unsolicited resumes from victims of the current "rightsizing" movement. Sometimes I am approached at trade shows or I receive a phone call asking for suggestions on how to find employment. Some of these people admit that they are "networking", a technique they learn from their outplacement firm. I usually ask them what trade or professional associations they belong to, and they usually answer none. If they are a member of an association, they usually have not been to a meeting in the last ten years. I tell them that they are missing one of the best networking opportunities by not attending IEEE chapter technical meetings where they can meet their peers in the industry.

During the reception or dinner portion of the technical meeting, you can obtain people's candid view of their company and learn of any opportunities for advancement or expansion at their company. You can also learn about the type of projects these engineers are working on. Is this the kind of work you would like to do? Are these the kind of people you would like to work with? Besides learning about technical advances in your field, you are starting to make friends and meet others who will become the best possible references for future job searches. This is what you should do while you are employed, not when you are looking for a job. It takes time to cultivate a network, so it is never too soon to start.

I would also provide the same advice

to people who want to start their own business, especially in consulting. Do not just attend meetings, but volunteer for a committee position or become an officer in a technical society chapter. Better yet, be a speaker and give a talk. This gives you more self confidence, experience, recognition, credibility and potentially valuable leads. As a speaker you are on stage demonstrating your depth of knowledge on a subject, your ability to communicate and your organizational skills. In the audience are your potential clients. They will make their decision based upon the confidence they develop in you from the way you presented the material and the way you fielded questions. Linger after the talk so that you can address more specific questions of the type your potential clients would rather not share with the audience. After the speech, reference your talk in your resume as you begin to establish yourself as an expert. Try out your consulting pitch on your peers and receive valuable feedback on the merits of your offering and the quality of your presentation.

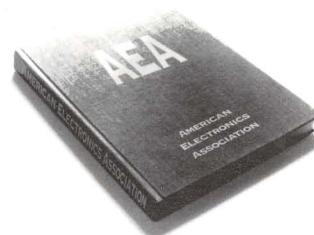
Every time an IEEE newsletter or announcement goes out with your name listed as an officer, committee person or speaker, you are receiving valuable public relations for only the cost of your time.

Not only can your IEEE experience be rewarding but it can also be fun. Our monthly IAS/IECI technical meetings at Nielsen's Restaurant in Elmwood Park were attended for the technical merit of the program as well as the opportunity of socializing with friends, telling engineering war stories and discussing industry trends. The friendships that we made there carried throughout our lives.

Being active in

IEEE does take time and energy but the payback can be immense. Being active in IAS, allowed me to meet many of the national IAS officers at society meetings. As a Chicago Section officer I represented the section at the Washington Award honoring Steven Bechtel. Next to me, at the head table, was John Swearingen, 1981 recipient. At the sections congress in Boston I met David Packard during the IEEE's Centennial gala. My MIDCON experience gained me worldwide travel, new IEEE and ERA friends in Dallas and Chicago, and an opportunity to meet with Mike Birck, Chris Galvin and Robert Galvin. At the recent Honors Ceremonies I met with Ken Olsen. These are opportunities that most engineers will never have if they limit their activities to working in their laboratories. If electrical engineering is your profession and your livelihood, then you should be willing to give something in return to your profession, not just by being an IEEE member and receiving a magazine, but by getting involved. The payback could be outstanding.

You're looking at the world's very first computer network.

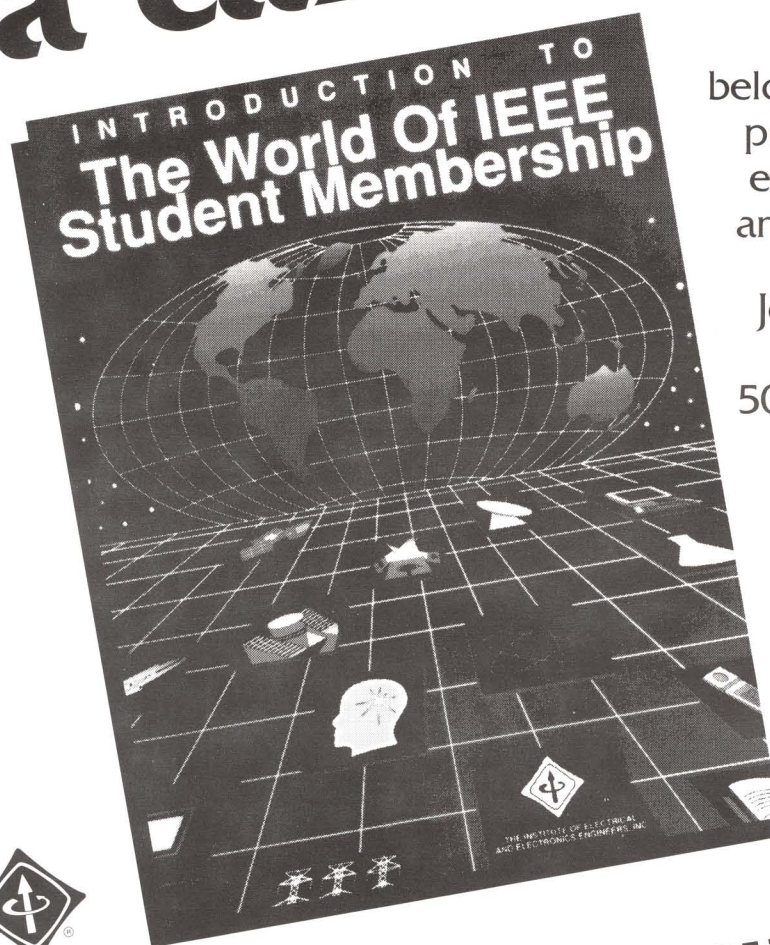


For over five decades the American Electronics Association has been an invaluable link for the electronics and information technology industry.

For more information on how you can join or get more involved in AEA's activities locally and nationally, call the AEA Midwest office at (708) 358-2705.

AEA

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From the Pages of SCANFAX

JANUARY 1975

Carroll Elected Region 4 Director

Paul F. Carroll, who has served the Chicago Section in many capacities including chairman, has been elected Region 4 Director. He is president, Semiconductor Specialists, Inc., Chicago, an electronics distributor specializing in high technology products. Since its founding in 1959 by Carroll, Semiconductor Specialists has expanded to ten branches in the United States and three wholly owned international subsidiaries in the United Kingdom, Germany, and Canada. Carroll is also Chairman of the Board of Midwest College of Engineering, Lombard, Ill.

MARCH 1971

Northwest Subsection Holds Dinner-Dance

The Northwest Subsection will hold a dinner-dance on Saturday, March 27, at Fritzel's in Arlington Heights, one-half mile north of Route 62 on Arlington Heights Road. After a steak dinner, a well-known northwest-side combo will play for the dancing pleasure of IEEE members and their wives.

Reservations are only \$18.50 per couple for dinner and dance. Get your tickets now by calling Bill Kusner at 727-1972.

Many wives have become interested in the IEEE since the founding of the Northwest Subsection and have attended the technical meetings. We hope that this social evening will bring out all the Northwest engineering couples. The evening should provide a welcome hint of spring and a sign that winter is over at last.

MARCH, 1971

MARCH 1972



The 1972 IEEE Recognition Dinner Committee has been hard at work planning a bang-up party for IEEE members. Seated (left to right): H. P. Korman, Q.R.C. Electronics, chairman; W. J. Kusner, Illinois Bell Telephone Co., section chairman; J. Q. Puca, Zenith Radio Corp.; Standing (left to right): G. J. Argall, Leo Burnett Company, program; D. R. Smithana, Twist Company, vice chairman; C. E. Erickson, Victor Comptometer Corp., publicity; J. D. Remson, Victor Comptometer Corp.; and George Spisak, Commonwealth Edison Co.

NOVEMBER 1984



Newly Elected Chicago Section Officers present Recognition & Appreciation Certificate to Past Chairman William Everson, Commonwealth Edison (2nd from left) as he hands gavel to Chairman George Thomas, Contemporary Control Systems, Inc. (2nd from right). From left, Treasurer Norbert Orszula, Brown and Root, Inc.; Secretary Margaret Jones, Bell Telephone Laboratories; and Vice Chairman Henry Korman, Gentry Sales & Engineering.



Scanfax

CHICAGO SECTION IEEE 1972-73 OFFICERS AND COMMITTEES

Chicago Section Officers



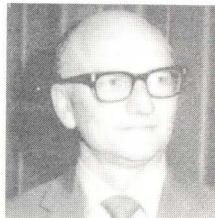
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HENRY A. SETTON
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 University of Illinois
 P.O. Box 4348
 Chicago, Illinois 60680
 996-2202



Secretary
JAMES RALSTON
 Allen-Bradley Company
 838 S. Des Plaines Avenue
 Chicago, Illinois 60607
 922-9302



Vice Chairman
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 Commonwealth Edison Company
 51 W. Jackson Street
 Joliet, Illinois 60435
 (815) 729-8126



Treasurer
DANIEL J. VEITH
 Building 214
 Argonne National Laboratory
 9700 S. Cass Avenue
 Argonne, Illinois 60439
 739-7711

Chicago Section Executive Committee



WILLIAM ARROTT
 Gardner, Jones & Company, Inc.
 79 W. Monroe Street
 Chicago, Illinois 60603
 782-5000



GEORGE J. MACK
 Illinois Bell Telephone Company
 225 W. Randolph Street
 Room 23-D
 Chicago, Illinois 60606
 727-3339



WILLIAM H. DUNBAR, JR.
 Commonwealth Edison Company
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 294-4300



RUTH L. OLDFIELD
 Gardner, Jones & Company Inc.
 79 W. Monroe Street
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JOSEPH FEITLER
 Programming Methods
 c/o Automatic Electric
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 Melrose Park, Illinois 60160
 562-7100 ex. 2377



DONALD OWEN
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 Chicago, Illinois 60651
 772-6500 ex. 3606



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 Consultronics
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 Elmhurst, Illinois
 832-4611



PAUL E. JAHN
Chairman, Fox Valley Subsection
 Commonwealth Edison Company
 4300 S. Ridgeland
 Stickney, Illinois 60402
 242-2550 ex. 213



WILLIAM J. KUSNER, Past Chairman
 Illinois Bell Telephone Company
 225 W. Randolph Street
 Headquarters 10-B
 Chicago, Illinois 60606
 727-1972



CHARLES J. HEERMANS
Chairman, Northwest Subsection
 General Time Corporation
 1200 Hicks Road
 Rolling Meadows, Illinois 60008
 259-0740

JANUARY 1970

The Calumet Subsection

Hazardous Areas—Problems and Answers

Robert Loewe, Sargent and Lundy, will address the Calumet Subsection on January 12, 1970, on "Hazardous Areas—Problems and Answers." He will discuss methods available to meet the requirements of the National Electrical Code in designing electrical installations for various types of hazardous areas. Loewe will examine the advantages and disadvantages of explosion-proof housings, intrinsic safety, purging and pressurization, physical isolation, etc. He will also suggest how to proceed when substances not listed in the National Electrical Code are encountered.

Loewe is eminently qualified to cover this subject. At present, he is head of the Electrical Specifications Department, Sargent and Lundy, Engineers. A partial listing of his extensive experience includes administrative and engineering positions with Argonne National Laboratory, Allis-Chalmers Manufacturing Company, and Commonwealth and Southern Corporation.



LOEWE

His technical society affiliations include senior member, IEEE, and a member of the Manufacturing Subcommittee of Petroleum and Chemical Industry Committee; senior member, ISA; member IES; associate member, NFPA; and member, ISPE and NSPE.

Loewe is a Registered Professional Engineer in Wisconsin, Illinois, and Indiana. He earned his BS and MS in electrical engineering at the University of Wisconsin.

Meeting will be held at Phil Smidt's Restaurant, 1205 Calumet Ave., Hammond, Ind. Social hour, 5:30 p.m.; dinner, 6:30 p.m.; meeting, 7:30 p.m. For dinner reservations, phone Cleo (312) 768-6686 or (219) 659-0025.

SEPTEMBER 1970

TREASURE HUNT 1970

The 1970 IEEE Treasure Hunt will take place, rain or shine, on Saturday night, October 3, 1970, from 7:00 p.m. to 12:30 a.m.

The Hunt will be limited to 150 cars. Reservations will be issued on a first-come, first-serve basis, so get your teammates together and send in your check.

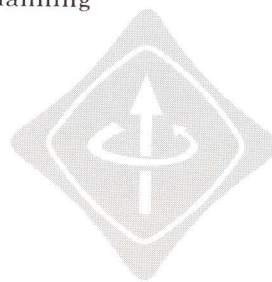
A Committee of twenty-eight people has been working on the Hunt since February. We have consulted with Ruth Jarvis, and she has given us the benefit of her twenty-four years' experience in planning Hunts.

Twenty clues have been selected for the Hunt. We will be spending the summer months and the month of September selecting clue locations and finalizing the map.

Tickets for the Hunt will be \$18 per couple. Only reservations for a full car (three couples) will be accepted. The ticket includes a roast sirloin of beef dinner at the Convention Hall of Henrici's O'Hare Inn following the Hunt. Tickets for the Hunt only will not be sold. If you attend the Hunt, you must pay for a dinner.

Make checks payable to IEEE 1970 Treasure Hunt and mail with coupon below to:

Creighton Warren
SCM Kleinschmidt
Lake-Cook Rd.
Deerfield, Ill. 60015



APRIL 1972

IEEE

RECOGNITION DINNER

SATURDAY, APRIL 8, 1972

TO AWARD IEEE RECOGNITION TO PERSONS DEMONSTRATING TECHNICAL EXCELLENCE IN ELECTRICAL & ELECTRONIC ENGINEERING

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PALMER HOUSE—RED LAQUER ROOM

INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS—CHICAGO SECTION

SEPTEMBER 1970

1970 Chairman's Message

Are *you* really relevant? Have you thought about it? This is a dynamic, changing world we are living in today and most institutions are changing or reorganizing to become more involved and more adaptable to the needs of their members, and thus the needs of society as a whole. We see our churches, colleges and other civic organizations all examining the ways in which they can become more involved in today's problems and better serve their membership.

The Chicago Section, too, is changing and becoming more pertinent with every day that passes. Many dynamic changes are taking place and many exciting issues are being examined at our meetings. The Chicago Section is changing, but what about you? Are you relevant, are you changing? Or are you still sitting on the sidelines being passed by?

What is the Chicago Section doing to stay germane in our fast moving society? The Section is continuing its program sub-dividing geographically to better serve you and more importantly to afford you the opportunity of being more active in your IEEE. Last year saw the maturing of the Calumet subsection to full status. We also saw the continued growth of the dynamic Fox Valley subsection and this year we start out with the brand new Northwest subsection to better serve our members in that area. The Chicago Section is further changing the format of the section meeting to a much broader social, special-event type of meeting. This year many of the section meetings will be held in conjunction with the very popular events such as the Treasure Hunt, Showtime, NEC, Spring Party, Spring Conference and others. This format should allow you and your wife and friends to meet and enjoy yourselves in a social atmosphere. This new plan then leaves the more formal technical programs to the subsections and groups.

But what about you; are you

really relevant? Where were you when the Power Group presented the panel on air pollution in Chicago. What about the time when the Spring Conference on Broadcast and Television Receivers had a panel discussion on the dangers of x-ray radiation from television sets? Then there was the night the Bio-medical group presented the facts on artificial heart transplantation. And did you make the Vehicular Communications meeting on controlling crime in the streets? What of air traffic congestion? Space exploration? Did you make these? Don't let them pass you by again this year.

Come out and join in the excitement of the '70s. We don't even require that you grow a beard or wear sandals. We promise to try to keep up the high level of excitement created by our energetic past chairman, George Spisak and his dedicated associates last year. For their fine activities and direction we give them a resounding thanks.

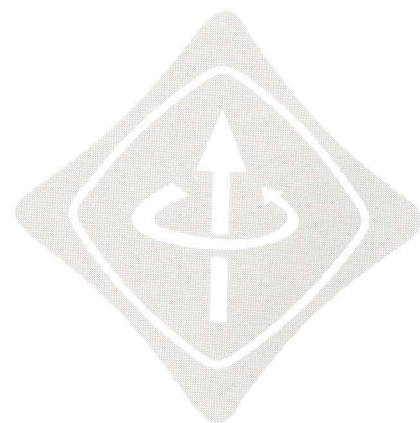
See you at the Treasure Hunt.

Bob Nunamaker
Chairman

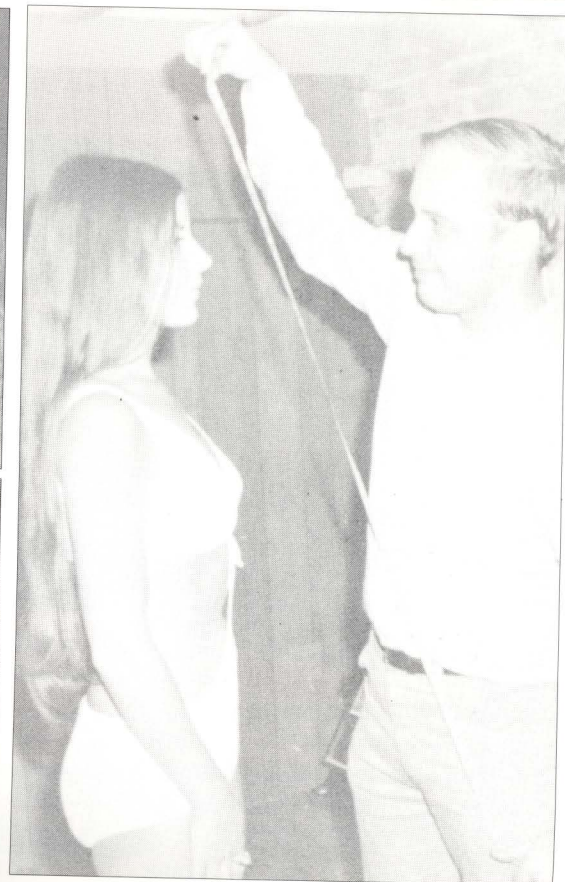
Chicago Section, IEEE

CHICAGO
SECTION

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INSTITUTE OF
ELECTRICAL AND
ELECTRONICS
ENGINEERS

NOVEMBER 1971



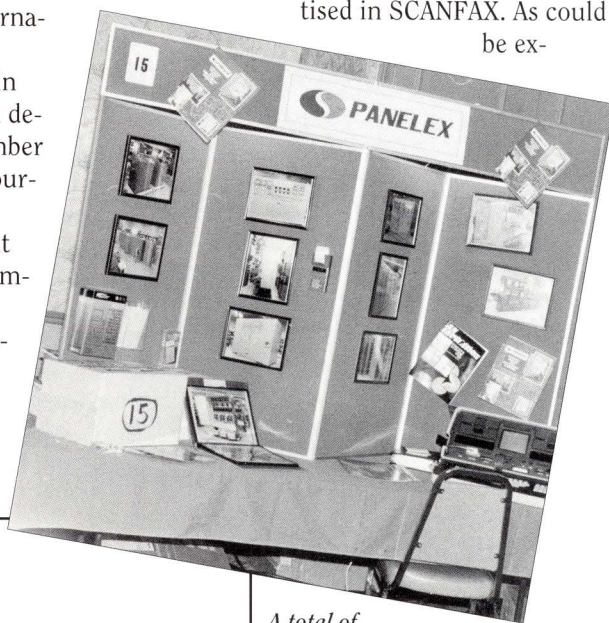
IAS Exhibitors Night

For many years the Instrument Society of America (ISA)-Chicago Section would host an annual Exhibitors Night where vendors would showcase their wares to the local ISA membership. The format was simple, each vendor paid \$50 to \$100 per table to setup a table top display for one evening in a ballroom at a local hotel. There was no charge for attendees and often times attendees were enticed to come with an offer of free refreshments. The event was a excellent revenue generator for the local ISA section.

The Industry Applications Society (IAS) would always have joint meetings with the Industrial Electronics and Control Instrumentation Society (IECI), and together the membership was not much less than ISA's membership. Since some of these members were also members of ISA they attended Exhibitors Night. Being familiar with the format of the event and the potential for gaining recognition for our joint society, we decided to establish our own Ex-

In the fall of 1979, the International Instrument Society of America show was to be held in Chicago, and the local section decided not to put on the November Exhibitors Night so as to encourage vendors to exhibit at the larger show. We decided to put on our show during this November time frame that was now left vacant and at the same hotel that ISA used — the Hillside Holiday Inn. We invited instrument and control vendors as well as vendors in the

11, 1981, for our second Exhibitors Night. This time we sought more IEEE Chicago Section support and advertised in SCANFAX. As could be ex-



A total of 30 to 40 vendors would setup table top displays for the evening.

pected, the weather did not cooperate. We experienced a very cold evening, and some vendors were unable to reach Chicago to exhibit due to weather related transportation problems. This was a disappointment for all, but undaunted we held our third Exhibitors Night in April, 1982 hoping for better weather. The weather did not cooperate this night either, and interest in the event began to subside as well as the energy

from our joint society to put on another event. This was our last event.

Each of the three IAS Exhibitor Nights were financially successful, but MIDCON, an electronics trade show sponsored by our Chicago Section, was now becoming an excellent revenue source for the section. We decided more was to be gained by directing our energies towards MIDCON instead of Exhibitors Night. We were still proud of the fact that our little IAS/IECI group could put on three Exhibitors Nights with very little resources and no show management staff. By the way, the ISA — Chicago Section is still putting on their Exhibitor Nights, continuing their successful tradition.

EXTENDS AN INVITATION TO VISIT THEIR BOOTH AT



**INSTITUTE OF
ELECTRICAL AND
ELECTRONICS
ENGINEERS, INC.**

THE CHICAGO CHAPTER

**INDUSTRY APPLICATIONS SOCIETY
AND
INDUSTRIAL ELECTRONIC CONTROL
INSTRUMENTATION SOCIETY**

Exhibitors Night

APRIL 21, 1982
4:00 PM TO 9:00 PM
HILLSIDE HOLIDAY INN

Each vendor was given a stack of invitations that would be distributed to their customers.

power field. Vendor support was excellent and we held our first IAS Exhibitor Night in November of 1979. Attendance was moderate, but the vendors were happy so we decided to repeat the event the following year. The problem was that we needed to find an alternate date since ISA was to resume their normal November schedule.

If you ever studied trade show dates, you will find much competition for spring and fall dates. We needed to move to a winter date that was not near the November date that ISA always used. We ended up with February

The IAS Exhibitors Night was held in a Hillside Holiday Inn Ballroom.



hibitors Night patterned after ISA's while inviting many of the same vendors that exhibited at ISA's Exhibitors Night. We needed a way to introduce our show without directly competing with ISA. In 1979 we had our chance.

Chicago Section Chairmen—100 Years

— LOCAL HONORARY SECRETARIES —

1893 – 1894.....	Edward Caldwell
1894 – 1895.....	B.J. Arnold
1895 – 1896.....	Wilbur Stine
1896 – 1897.....	Wilbur Stine
1897 – 1898.....	Richard H. Price
1898 – 1899.....	Richard H. Price
1899 – 1900.....	Richard H. Price
1900 – 1901.....	Richard H. Price
1901 – 1902.....	Richard H. Price

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1903 – 1904.....	George A. Damon
1904 – 1905.....	George A. Damon
1905 – 1906.....	Kempster B. Miller
1906 – 1907.....	Kempster B. Miller
1907 – 1908.....	P.B. Woodworth
1908 – 1909.....	H.R. King
1909 – 1910.....	W.L. Abbott
1910 – 1911.....	J.G. Wray
1911 – 1912.....	J.G. Wray
1912 – 1913.....	Ralph H. Rice
1913 – 1914.....	D.W. Roper
1914 – 1915.....	E.W. Allen
1915 – 1916.....	W.J. Norton
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1917 – 1918.....	William J. Crumpton
1918 – 1919.....	C.A. Keller
1919 – 1920.....	A.F. Riggs
1920 – 1921.....	J.R. Bibbins
1921 – 1922.....	M.M. Fowler
1922 – 1923.....	F.E. Goodnow
1923 – 1924.....	J.E. Kearns
1924 – 1925.....	G.H. Jones
1925 – 1926.....	Carl Lee
1926 – 1927.....	K.A. Auty
1927 – 1928.....	B.E. Ward
1928 – 1929.....	P.B. Juhnke
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1930 – 1931.....	J.P. Kobrock
1931 – 1932.....	F.R. Innes
1932 – 1933.....	L.R. Mapes
1933 – 1934.....	E.C. Williams
1934 – 1935.....	D.L. Smith
1935 – 1936.....	F.A. Rogers
1936 – 1937.....	Burke Smith
1937 – 1938.....	N.C. Percy
1938 – 1939.....	J.A. Fitts
1939 – 1940.....	A.J. Krupy
1902 – 1903.....	George A. Damon
1974 – 1975.....	Jim Ralston
1941 – 1942.....	K.V. Gleuntzer
1942 – 1943.....	J.C. Woods
1943 – 1944.....	F.E. Keith
1944 – 1945.....	R.C. Ericson

1945 – 1946.....	J.F. Calvert
1946 – 1947.....	T.S. Gray
1947 – 1948.....	J.E. Hobson
1948 – 1949.....	F.D. Troxel
1949 – 1950.....	H.E. Nason
1950 – 1951.....	E.L. Michelson
1951 – 1952.....	W.M. Ballenger
1952 – 1953.....	R.R. O'Connor
1953 – 1954.....	R.W. Jones
1954 – 1955.....	H.R. Heckendorn
1955 – 1956.....	R.B. Gear
1956 – 1957.....	E.R. Whitehead
1957 – 1958.....	E.G. Noreli
1958 – 1959.....	J.A. Romano
1959 – 1960.....	Francis A. Cox
1960 – 1961.....	W.T. Larnier
1961 – 1962.....	G.L. Welch
1962 – 1963.....	G.H. Enenbach
1963 – 1964.....	Frank Scott
1964 – 1965.....	Daniel Anderson
1965 – 1966.....	John McManus
1966 – 1967.....	David Gilman
1967 – 1968.....	Paul Carroll
1968 – 1969.....	John Mikos
1969 – 1970.....	George Spisak
1970 – 1971.....	R.J. Nunamaker
1971 – 1972.....	William Kusner
1972 – 1973.....	Henry Setton
1973 – 1974.....	Richard Bulley
1940 – 1941.....	F.V. Smith
1975 – 1976.....	Daniel Veith
1976 – 1977.....	Paul Jahn
1977 – 1978.....	Robert Wagborne
1978 – 1979.....	John Waters
1979 – 1980.....	Charles Hadstad
1980 – 1981.....	Paul Geiger
1981 – 1982.....	Dennis Lamont
1982 – 1983.....	Howard Wolfman
1983 – 1984.....	William Everson
1984 – 1985.....	George Thomas
1985 – 1986.....	Hank Korman
1986 – 1987.....	Bert Orszula
1987 – 1988.....	Ed Barrett
1988 – 1989.....	Joe Feitler
1989 – 1990.....	Robert Schrage
1990 – 1991.....	George Stout
1991 – 1992.....	John Truitt
1992 – 1993.....	Barry Brusso
1993 – 1994.....	Len Cohen

Prepared by: Don Harris, September 9, 1993

Info from: Center For The History Of Electrical
Engineering — Andrew Goldstein

IEEE Chicago Section — George Spisak & Ed Barrett

The Beginning, Development and Contributions of S&C Electric Company

S&C's commitment to the electric power industry traces back to 1909, when two visionary utility engineers ó Edmund O. Schweitzer and Nicholas J. Conrad, both employed by the Commonwealth Edison Company, Chicago ó created the first reliable high-voltage fuse. These men were in the construction and start-up of central stations when central stations were in their infancy and breakdowns were the order of the day. One such breakdown, at Commonwealth Edison's Fisk Street generating station, was so serious that a team of experts headed by Charles Steinmetz was called in. A determinative point of the problem was the potential transformer's expulsion fuse that failed to clear when the transformer shorted out.

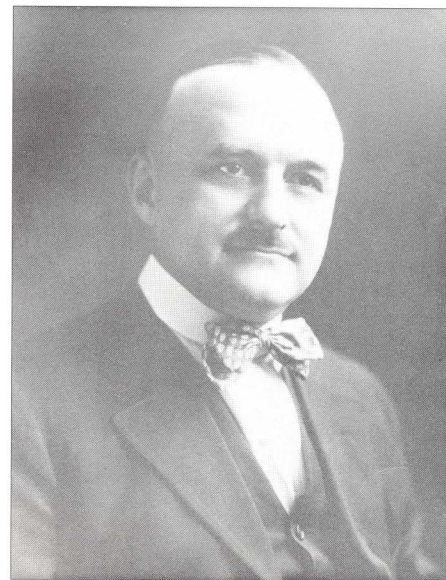
Messrs. Schweitzer and Conrad had seen fuse failures before, but this failure sparked the idea for two new concepts in fuse design:

- 1) a spring under tension to provide stored energy for lengthening the arc; and
- 2) a fuse tube filled with a noncombustible liquid for extinguishing the drawn arc.

On their own time they worked to develop this better fuse ó the S&C Liquid Fuse. And in 1911 they formed a partnership under the name of Schweitzer & Conrad to make the fuse.

The liquid fuse received immediate acceptance. It expanded the scope of high-voltage fuse protection and helped to bring about widespread adoption of outdoor distribution substations by electric utilities in more than 25 countries, becoming the standard of the world. In 1916 the demands of the business prompted Mr. Conrad to leave Commonwealth Edison to devote full time to S&C while Mr. Schweitzer stayed on with the utility.

The company's first home, when founded in 1911, consisted of three rented rooms on the second floor of a small building on the north side of Chicago. By 1917 S&C had outgrown the three rooms, and a new one-story factory was built nearby. Accessories, fuse mountings, and disconnect switches were developed to complement the liquid fuse. Lightning arresters, choke coils, and voltage detectors were added as product lines. And a second generation of liquid fuses embodying coiled, strain-relieved silver elements was introduced. Now, time-current characteristics were ac-



Edmund O. Schweitzer (top) and Nicholas J. Conrad (bottom), engineers with Commonwealth Edison, founded Schweitzer & Conrad in 1911 to make high-voltage liquid power fuses.

curate and permanent; fuse blowing speed was predictable; and fuse coordination became feasible.

By 1930 corporate consolidation had become commonplace, and it seemed only logical for S&C to do business in the future under the wing of a large corporation. So Messrs. Schweitzer and Conrad sold their controlling interests to Cutler-Hammer, a leading Milwaukee-based manufacturer that was broadening out from its spe-

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cial field of motor control. Mr. Conrad withdrew from active participation in the daily affairs of S&C, and Mr. Schweitzer continued on at Commonwealth Edison.

During the depression, the sales of liquid power fuses dropped sharply. But the market for more-economical fuse cutouts held firm. Therefore, S&C transplanted its know-how from power fuses for substations to fuse cutouts for overhead lines. In the late thirties S&C's Load Interrupter switch was introduced. Another development was S&C's SM Power Fuse, its first solid-material fuse, using boric acid for arc quenching. World War II came and S&C channeled its efforts to wartime requirements. A high-voltage channel selector switch was produced for navy radars. And, because of the wartime critical shortage of circuit breakers, S&C Power Fuses were combined with S&C Load Interrupter Switches to substitute for circuit breakers — this was the advent of metal-enclosed switchgear.

In 1945 Nicholas Conrad reacquired

the controlling interest held by Cutler-Hammer, as well as Mr. Schweitzer's minority interest.

Mr. Conrad also prevailed upon his son John to join S&C; John had entered the aircraft industry in 1937 and had been with Douglas Aircraft since 1938. Production capacity of S&C was doubled between 1945 and 1949. In 1949 an additional factory unit was completed on a new 10-acre site only 2-1/2 miles from S&C's original plant. That site is, today, S&C's 45-acre Ridge Boulevard Industrial Complex, with 22 buildings totaling more than 1,000,000 square feet under roof. To John Conrad, currently chairman of the board and ceo, who became president of S&C in 1952, it was clear that S&C's historic role of



The first S&C Liquid Power Fuse was tested in July, 1911, on a 3-kW transformer.

specialization could be perpetuated if it remained privately held, as opposed to diversifying through going public with consolidations, acquisitions, mergers, and take-overs.

S&C's latest product innovations are in the area of distribution automation... Scada-Mate® Switching Systems for overhead distribution, and Remote Supervisory Pad-Mounted Gear for underground distribution. Self-powered and self-contained, these systems provide complete distribution automation switching installations.

Since its beginnings, S&C has maintained a steadfast commitment to pioneer innovative concepts and products for the electric power industry. Its product line has broadened extensively, but always within the field of high-voltage switching and protection. S&C has brought the industry a steady succession of unique products pioneering new applications and contributing to improved operating practices for electric-utility, commercial, and industrial power systems.

IEEE Chicago Section Profile

The IEEE Chicago Section is one of about 284 local bodies known as Sections disbursed among ten administrative Regions worldwide all part of the member organization known as The Institute of Electrical and Electronics Engineers, Inc.

The Chicago Section membership located in Region 4 represents about 2.2% of the entire 320,000 individuals worldwide, in electrical, electronics, computer science and other related work areas. The membership served by the Section reside in the following counties in Illinois in their entirety: Bureau, Dupage, Grundy, Kane, Kankakee, Lake, LaSalle, McHenry, Putnam; Cook County in Illinois — except townships of Bloom, Bremen, Rich, Thornton; Will County in Illinois — except townships of Crete, Monee, Washington, Will.

To accommodate the technical interests of its members who reside out-

side the City of Chicago limits two Subsections were formed, The Fox Valley Subsection and The Northwest Subsection, the former was established in 1963 while the latter in 1970. The territory served by the Fox Valley Subsection is in the Counties of Dupage and Kane and that portion of the City of Elgin in Cook County in Illinois, while the territory served by The Northwest Subsection is in those portions of Cook, Lake and McHenry Counties in Illinois that are North of Lawrence Avenue and West of the Edens Expressway/Skokie Highway — except for The City of Elgin.

The IEEE's technical objectives are directed at advancing the theory and practice of electrical, electronics and computer science. In addition it works to advance the professional standing of its members, and has a mandate to enhance the quality of life for all people through the application of its tech-

nologies. The Chicago Section's objectives mirror those of the Institute through local activities consisting of technical meetings, educational activities, professional activities, conferences and symposia, social and non-technical activities.

The technical activities of the Section are primarily conducted by its Chapters or technical subunits. These chapters function in a manner similar to that of a committee of the Section in terms of administrative matters but operate independently to serve their technical society members interests. IEEE serves the technical interests of its members through 37 technical Societies through publications, educational programs, conferences, symposia and other means. The Chicago Section has 14 active technical Society Chapters serving the local interests of the membership.



THE INSTITUTE OF
ELECTRICAL AND
ELECTRONICS
ENGINEERS, INC.



FOX VALLEY SUBSECTION

Fox Valley Subsection Chairpersons:

Term	
1961-62	George Austin*, <i>Commonwealth Edison</i>
1962-63	Elgin Enabnit, <i>Electric Light & Power</i>
1963-64	Arthur Leininger, <i>Illinois Bell</i>
1964-65	J. Ray Lies, <i>Commonwealth Edison</i>
1965-66	Harry Hummel, <i>Motorola</i>
1966-67	Len Bateman, <i>Illinois Bell</i>
1967-68	Donald Stier, <i>Automatic Electric</i>
1968-69	James Fancher, <i>Commonwealth Edison</i>
1969-70	John Tyner, <i>Griswold-Eshleman</i>
1970-71	Daniel Veith, <i>Argonne Laboratory</i>
1971-72	Edwin Edwards, <i>Commonwealth Edison</i>
1972-73	Paul Jahn, <i>Commonwealth Edison</i>
1973-74	Michael Musko, <i>Argonne Laboratory</i>
1974-75	Loren Ray Norberg, <i>Commonwealth Edison</i>
1975-76	David Georg*, <i>Westinghouse</i>
1976-77	Chuck Borchert, <i>A. T. & T.</i>
1977-78	William Everson, <i>Commonwealth Edison</i>
1978-79	Charlie Brigham, <i>Illinois Bell</i>
1979-80	Alan Seagren, <i>Commonwealth Edison</i>
1980-81	Ed Barrett, <i>Contemporary Control Sys.</i>
1981-82	Abbas Hormozi*, <i>Sargent & Lundy</i>
1982-83	Norbert Orzula, <i>Brown & Root</i>
1983-84	Charles Hollocker, <i>Western Electric</i>
1984-85	Lawrence Hall, <i>Westinghouse</i>
1985-86	Abbas Hormozi*, <i>Sargent & Lundy</i>
1986-87	Larry Schultz, <i>McGraw-Edison</i>
1987-88	Beverly Barnes, <i>A. T. & T.</i>
1988-89	Dorene Lehner, <i>A. T. & T.</i>
1989-90	John Gavin, <i>Cooper Power Sys.</i>
1990-91	Sam Kelley, <i>S. K. Technical Svcs.</i>
1991-92	Channing Brown, <i>Sargent & Lundy</i>
1992-93	Martin Lake, <i>A. T. & T.</i>
1993-94	David Schumacher, <i>A. T. & T.</i>

*Deceased

One midsummer night in 1961, a score or so of IEEE members met in a noisy basement meeting room at a popular West Chicago bowling alley. One of the group explained a tentative plan to organize a subsection — a semi-autonomous unit with the same general functions as the Chicago Section — in DuPage and Kane counties. Did the invitees — a cross-section of known IEEE members in the western suburbs — believe the plan was viable? The straw vote was affirmative. The chairman pro tem appointed a nominating committee — "you, you and you" — to prepare a slate, and the meeting adjourned.

The nominating committee — Ray Lies, about 40, from Commonwealth Edison; Bill Quist, in his sixties, from Automatic Electric; and Jim Fancher, from Motorola, not yet 30 — met in the bowling alley bar, and, over the noise of crashing pins nearby, agreed on two points: One, they didn't know each other, much less the rest of the potential members. Second, the engineer who had led the meeting, George Austin of Commonwealth Edison (actually a substitute for Elgin Enabnit, who had been called out of town) having done a first-rate job that evening, and obviously energetic and possessing good ideas, was the logical choice for chairman of the new Subsection. The ball was in motion, and by September Fox Valley was sponsoring programs in the western suburbs.

Implicit in the formation of the Fox Valley Subsection were some realities facing the Chicago Section, not all of them comfortable. Regular meetings of the Section were still being held at the Chicago Engineers Club at 72 East Randolph Street, across from the Chicago Public Library. But attendance had been spotty; members complained that a dinner meeting and program in the Loop left them facing slow and infrequent train service to their suburban homes. Moreover, not only were most members now living in suburbia, but industry was also gravitating there. And not a few members worried about their personal security when in the Loop at night.

The answer seemed obvious: Take the programs to the members. A subsection in the area along the Indiana state line, later to become the independent Calumet Section, was in the early stages; a subsection in the northwest suburbs followed Fox Valley by a few years. The amoebic flow of programs away from the city core depleted the Section's own program offerings, but the total number of programs, and the total attendance, grew substantially. The Section co-sponsored occasional meetings with the subsections, while its leadership concentrated on supporting the new organizations and stimulating technical chapter activities.

From its inception, Fox Valley Subsection relied on strong communications: Monthly program announcements, telephone trees, office posters, and, very importantly — part of the legacy from George Austin, the first chairman — an annual program schedule, sent to members before the first fall meeting. The advance scheduling effort required during the summer vacation months is more than repaid by the member awareness and support during the program season. (One Chicago Section officer was amazed that Fox Valley could accomplish this with a small group of volunteers, while the much larger Section wrangled for months!) Fox Valley pitches its programs to the general membership, varying its menu among different technical disciplines. Programs are frequently held jointly with technical chapters in order to provide high quality presentations.

Today, in its 33rd season, Fox Valley Subsection continues to provide its members a window on all parts of the electrical engineering profession. Dinner meetings are held approximately monthly, with one or two industrial tours, as available. Executive committee meetings are generally held the week prior to a meeting. During the late spring and early summer, brainstorming sessions are held to generate program ideas, and all interested members are invited to participate. Fox Valley Subsection is proud of its contribution to the Section's 100 years, and will continue its support in the coming decades. — *Jim Fancher*

Chicago Section Receives “Century of Achievement” Plaque

*Remarks by Martha Sloan,
IEEE President, February 27, 1993*

“Tonight, we will also honor our host, Chicago, as it becomes the first IEEE Section to celebrate its 100th anniversary.

In 1893, while the rest of the country was enjoying the Chicago World’s Fair, a group of Chicago engineers was petitioning the American Institute of Electrical Engineers to hold local meetings outside New York, where AIEE was headquartered. AIEE New York members attending the Fair were impressed with Chicago and the advances made in electricity since the International Electrical Congress held in 1884, when the AIEE was created.

It was agreed that Chicago could hold simultaneous meetings with those in New York. These meetings began in 1894 and continued through 1902, when the concept of Sections was adopted. Since then, the Chicago Section has continued to prosper and now

represents more than 7000 electrical engineers in the Chicago area.

Chicago has witnessed many advances in electrical technology in the last 100 years and electrical engineers from the Chicago

Section have contributed to these advancements. Technology in Chicago is as diverse as the number of IEEE Societies that hold regular meetings within the Section—such as Power Engineering, Communications, Computers, and Industry Applications.

We are proud to be holding the IEEE Honors Ceremonies here in Chi-



LEFT: Barry Brusso proudly displays Century of Achievement Plaque
RIGHT: 1993 IEEE President, Martha Sloan



cago on the occasion of the Section’s Centennial. I would like to ask Chicago Section Chairman, Barry Brusso to join us on stage...Barry, in recognition of the 100 years of distinguished service by members in the Chicago Section, it is my pleasure to present this token of appreciation.”

IEEE Regional Activities Board Presents Centennial Banner to Chicago Section

Left to Right...

STANDING BY BANNER: Len Cohen, Luis T. Gandia, Howard Wolfman.

SECOND ROW: Charles W. Turner, Edward A. Capouch, Vernon D. Albertson, Tsuneo Nakahara.

THIRD ROW: Eduardo Arriola, Warren R. Foxwell, S. Naqi Akhter.

SITTING IN FRONT ROW: Joel B. Snyder, Arthur Van Gelder, David A. Conner, James V. Leonard, Chester C. Taylor, Vijay K. Bhargava.

SECOND ROW: Kurt R. Richter, Mary Ann Hoffman, Robert P. Noberini, Judith R. Grady, John Kaczorowski, Forrest L. Stattanson.

THIRD ROW: Paul Y.S. Cheung, Melvin I. Olken, Hugo Fernandez Versteegen, Robert T.H. Alden, Daniel C. Toland, David G. Green, Juan Carlos Miguez.



The Life of the Electrical Engineer in the Year 2093

Len Cohen
October 28, 1993

In the last hundred years the slide rule and the typewriter have evolved into the desk top computer. In the next hundred years computers will have virtually unlimited memory. The hardware will be smaller and the printers more versatile. The key board will be replaced by voice activated input.

In the year 2093 the life of the electrical engineer, as well as the general population, will be influenced by three main factors:

- 1) a world with double the present population;
- 2) the exhaustion of fossil fuels as an economic consideration; and
- 3) computers.

Just about everything will be computer controlled. On the job the electrical engineer will have computers to aid in the design and development of new products. Assembly lines will be computer controlled. Most manufacturing will be done by computer controlled machines. CAD/CAM will give way to CD/CM — computer design/computer manufacturing, aided by the engineer. If we extrapolate from the current trends, products will get smaller, more efficient, and more complex.

In the field of medicine there will be faster and better diagnostic instruments. X ray equipment will be safer, MRI equipment will be cheaper, mechanical drills and saws will be replaced by lasers, organ transplants will be more common. A visit to the family doctor will be relatively rare. Routine exams and minor ailments will be handled by computers. If the treatment requires medication the computer will generate a prescription that will be electronically sent to the pharmacy.

Virtually all teaching will be done by computers but teachers will still be needed in the lower grades to teach students how to read and write and how to use the computer. After that computers will provide instructions to the higher grades. Of course home

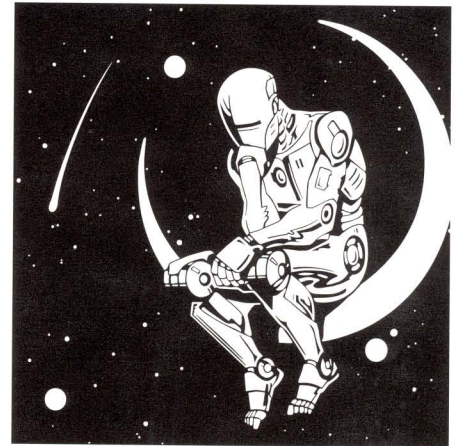
work will be done with the aid of computers and grading of work will be done by computer. At the post graduate level computers will be used to store and analyze data derived from experiments and research.

In the field of home entertainment the stereopticon and the record player of 1893 have been replaced by television and hifi audio equipment. In 2093 television screens will be bigger and compact discs will be smaller. The VHS format vcr will go the way of the 8 track tape and the BETA format. An entire movie with hifi sound will be recorded on postage stamp sized records.

Hundreds of television channels will be available from all over the world. With TV stations broadcasting from transmitters in satellites orbiting the earth, global reception will be available without cable. Computers and television will put the viewer virtually into the concert hall or playing field. Interactive computer games will make board games obsolete. The player will actually feel like a participant. High definition tv and high fidelity sound will make it unnecessary to leave the home for entertainment. However, sporting events and live concerts will still be popular. New electronic instruments will be added to orchestras producing sounds and music not available with conventional instruments. The sound and graphics at the ball park will make every seat equivalent to a front row seat on the fifty yard line.

In 1893 there was no radio and the telephone was in its infancy. Now the two entities have combined into the cellular telephone. By 2093 worldwide telephone coverage will be possible with smaller transmitter/receivers. The source of energy; the battery of today will provide enough energy to operate a portable phone for weeks or months.

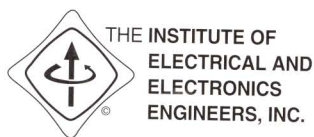
Since most fossil fuels will have been exhausted. Most power will be generated by nuclear reactors and by replaceable natural resources such as hydroelectric, wind and solar generators. Cogeneration will be a major source of power. Superconductors and



super magnets will be used to make generators more efficient and smaller.

Robotics will take over manufacturing. Only prototypes and repairs will be done by people. Factories of course will be completely automated. And most homes will be built in factories. However, few people will live in stand alone homes. Most people will live in huge apartment buildings. Supermarket shopping will be done at a computer terminal. The products will be displayed on the screen along with the price and size of the packages. It won't be necessary for cereal manufacturers or producers of other food products to design fancy packages that take up a lot of shelf space as the shopper will never see the shelf displays. The shopper will enter the shopping list into the computer and the order will be filled and sent up to the apartment in a dumb waiter. People who don't live in apartment buildings will shop the same way but will have to pick up their order at the supermarket.

Automobiles will be electrically powered. The source of power will be either high energy batteries or nuclear power. Magnetic levitation will provide a smoother more efficient ride. There will be no more flat tires and parallel parking will be easy with cars that can go sideways. Sensors will warn the driver of potential danger and tell the driver when maintenance is needed. An on board navigation system will help the driver find his destination by the best route.



IEEE RECOGNITION DINNER

The RECOGNITION DINNER COMMITTEE Congratulates the Chicago Section On the 100th Anniversary of the Establishment of its Founding

Chairman
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United Chemi-Con Inc.

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Waters Associates

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SOLICITATIONS COMMITTEE

Chairman
SHELDON ISENBERG
Northrop Corporation

JOHN ELLIS
Motorola, Inc.

The Recognition Dinner Committee is made up of a group of engineers, many of whom have been Chairmen of the Chicago Section. Its purpose is to organize an annual event to honor the years local recipient of Fellow grade. The international IEEE organization presents this award to those individuals who have made outstanding contributions to the Electrical, Electronics, and Computer Science fields.

We also use this occasion to honor meritorious student members from our local Student Chapters as well as their Faculty advisors.



Pictured are current members of the Recognition Dinner Committee. Front row left to right are Norbert Orszula, Frank Lakowski, John Waters. Back row Ray Schulenberg, Sheldon Isenberg, Gene Golemo, and Joe Feitler.

The 1994 Recognition Dinner will be held on Saturday April 30, 1994 at the Avalon Banquets, 1905 E. Higgins Road Elk Grove Village.

The generous contributions of companies in the Chicago area who employ our members, allow us to present this awards ceremony at an affordable price.

Please mark you calendars and plan on attending.

A Brief History of the Joint Antennas & Propagation and Microwave Theory & Techniques Chapter

by Clarence Arnow

The Chicago chapter of the IRE Professional Group on Microwave Theory and Techniques was founded in 1954 when the IRE was a separate organization from the AIEE. The Chicago chapter was founded by a microwave group at Motorola. The first chairman was Ed Dyke and Clarence Arnow was the third. The group became a combined chapter with Antennas and Propagation in the late fifties. Andrew Antenna Corporation was very instrumental in forming that Chapter.

At that time most of the members were from Motorola, Hallicrafters (later Northrop), Zenith Radio, Admiral Corporation, IIT Research Institute and the electrical engineering departments of the local universities. Our first meetings were held in downtown

Chicago at the Western Society of Engineering Building. This was a central location since all organizations except Andrew Corporation were still in the city of Chicago.

The meetings were joint with all the other chapters of the IRE. An open meeting of general interest was held for one hour, and then the individual chapters would have their separate meetings. Attendance at the meetings in the 1950s and 1960s numbered 25 to 30 individuals. Andrew Corporation was normally present with 8 to 10 persons and dinner was paid by Andrew for their group. As the companies moved out to the suburbs, our meeting places also moved northwest and joint meeting with the IRE/IEEE were discontinued.

It was decided to have one field trip a year, held on a Saturday. Some of the

locations were: Nike Sites, FAA Installation, Andrew Corporation, a cable company central terminal and other locations of general interest.

The chapter hosted the International Microwave Theory and Techniques Symposium in 1973. It was the first microwave symposium to include exhibitors. A Microwave Expo was held in the mid-eighties for a period of three years. This was sponsored by manufacturers' representatives and other microwave companies. Besides exhibiting equipment, papers were given by some of the exhibitors on current topics of interest. Attendance numbered over 100. The Joint IEEE Antenna and Propagation Society/URSI Radio Science Symposium was held in Chicago in 1992 with the chapter playing a leading role in its organization.



*The Chicago Section would like to thank
the following for their support during our Centennial Year!*

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