

IEEE CENTER FOR THE HISTORY OF ELECTRICAL ENGINEERING

Newsletter

Number 2 February 1983



Planning for the Franklin Institute's Electrical Exhibition in the fall of 1884 gave the initial impetus to the founding of the American Institute of Electrical Engineers. This picture is from the Exhibition's catalogue.

will be available to IEEE sections and other groups in 1984. Other spin-offs from the exhibit may include publications and duplicates of the exhibit panels.

CENTENNIAL HISTORIES

Another aspect of the Center's Centennial efforts is promoting and assisting the preparation of a number of historical books and articles. The preliminary organization of the IEEE Archives (described in the last *Newsletter*) and the development of the Center's picture collections have been particularly important in this regard. The major projects under way include the writing of the Institute's official Centennial history by Michal McMahon, an independent historian working out of Philadelphia; the preparation of a less scholarly view of the IEEE's one hundred years by Donald Fink and John Ryder, both former presidents of the Institute of Radio Engineers (IRE); and a number of special issues of IEEE society transactions and magazines.

The IEEE History Committee, chaired by Dr. Harold Chestnut, has made the promotion of historical efforts by IEEE societies one of its major priorities for the Centennial. A number of societies have already appointed Centennial Committees or Centennial coordinators and have begun planning specific products and events for 1984. It is hoped that by May of 1983 all IEEE technical societies will have their Centennial planning under way.

The regional entities of the IEEE are also organizing historical programs for 1984, and many IEEE sections already have Centennial committees or coordinators at work preparing section histories, historical presentations for section meetings, special Centennial publications, and other appropriate Centennial products. While the IEEE Archives contain a few records related to section activities in the IEEE and its predecessor societies, the AIEE and the IRE, most documentation for such activities must be sought locally. The Center is trying to direct sections to local resources and to historians and others who are equipped to assist in explorations of the electrical engineering heritage of particular towns and regions. The IEEE Centennial offers a special opportunity for fruitful cooperation between engineers and local historians, cooperation that could yield products of lasting value.

CENTENNIAL FOCUS OF IEEE HISTORY EFFORTS

The one hundredth anniversary of the founding of the American Institute of Electrical Engineers (AIEE) in New York City in 1884 will be the occasion for a wide range of activities next year. Much of the work of the Center for the History of Electrical Engineering is in preparation for 1984's Centennial celebration, which will include exhibits, ceremonies, numerous publications, and a variety of other events and products.

The production of the IEEE Centennial Exhibit is a major item on the Center's agenda. The exhibit is scheduled to be used at the larger IEEE meetings in the United States, coupled with an expanded IEEE membership/services/publications exhibit. Because of its location on the floor of large commercial exhibition areas, the Centennial exhibit will feature no artifacts, but will instead be a pictorial treatment of one hundred years of the electrical engineering profession. It is the intent of the exhibit to concentrate on the people who have made

electrical engineering the most exciting and important source of new technology over the past century. Among them are not simply the inventors who are familiarly linked with technological breakthroughs, but also those individuals whose contributions to the profession were in forms not generally recognized by the public but that were no less crucial to the advancement of electrical engineering.

These include educators, entrepreneurs, journalists, laboratory directors, and, of course, the leaders of the profession's major societies. The historical, biographical, and pictorial research for the exhibit is under way, and preliminary design plans have been drawn up. The exhibit's production and circulation is sponsored by the IEEE Centennial Task Force.

As a by-product of the Centennial exhibit, the Center will be preparing an audio-visual package treating the exhibit's themes which

WORK IN PROGRESS

Note: It is hoped that one of the major functions of this *Newsletter* will be to exchange information about the research that is currently being pursued in electrical history. For our reports to be truly useful, they will have to be based on information sent to us by active researchers. We hope that readers will not hesitate to send their contributions.

Thomas J. Higgins, Professor Emeritus, Department of Electrical Engineering, University of Wisconsin-Madison, is working on an updated and expanded version of his well-known bibliographies in the history of electrical science and technology. Higgins is the author of *A Classified Bibliography of Publications on the History and Development of Electrical Engineering and Electrophysics* (University of Wisconsin, Engineering Experiment Station, Reprint No. 198, 26 pp.).

Bonnie Kaplan (Department of History, University of Chicago) is undertaking research for a dissertation on "Computers in Medicine, A Historical Perspective." The study will focus on "the effects of health care, research, and funding policies on the development of medical computing," and on how the culture and organization of medicine have affected "the development and adoption of computing technology."

H.L. Chadbourne (La Jolla, Calif.) is continuing his studies of pioneers in the American radio industry. He completed a work last year on William J. Clarke, who established America's first radio manufacturing firm in 1897. He is now

working on the career of Leonard Wildman, researching in the Signal Corps and other records in the National Archives and in a number of manuscript collections of the Library of Congress.

Larry Owens (Program in the History of Science, Princeton) is engaged in research on the career of Vannevar Bush, with special attention given to Bush's contributions to the development of modern information processing technology through the construction of his differential analyzer at M.I.T. in the 1930s and 1940s. Owens expects his work on Bush to go beyond a look at his engineering to encompass the full range of Bush's impact on American science and technology in the period between the Wars.

Stuart Blume (London School of Economics & University of Amsterdam) is extending his studies into the nature of technological change in biomedical engineering. His research focuses on three case studies: ultrasound, thermography, and NMR imaging, and will attempt to integrate an analysis of technological innovation with a look at how such innovation interacts with medical practice.

Jonathan Coopersmith (Oxford University) is continuing his work on a doctoral dissertation that will discuss the electrification of the Soviet Union, 1880-1930. He has recently completed additional research on a separate study of technical cooperation in U.S. and Soviet development of magnetohydrodynamics in the 1970s.

Stig Ekelöf (Institute for the History of Electricity, Chalmers University of Technology, Goteborg, Sweden) is working on a catalogue of the extensive collections in the history of electrical engineering in the holdings of Chalmers University. The current effort will also include a biographical guide to the careers of several hundred contributors to electrical science and technology. The Institute for the History of Electricity was established by Prof. Ekelof in 1970.

Robert L. Frost (Department of History, University of Wisconsin-Madison) is doing research for a dissertation on the nationalization of the French electric power industry in 1946 and the subsequent political, technical, and corporate history of the Electricite de France up to 1970.

Stuart Bennett (Department of Control Engineering, University of Sheffield) recently finished research at the Smithsonian Institution's Museum of American History in connection with a technical history of automatic control for the period 1930-1960. The finished history will make use of the records of military research in this area from both American and British repositories. In addition, he is editing a section on the History of Systems and Control for a forthcoming encyclopedia of the subject.

Texas Instruments, Inc., Dallas, Tex., has recently contracted for a historical study of the firm's development from 1930 to the present. The contract was awarded to History Associates, Inc., based in Gaithersburg, Md.

Bayla Singer (Department of History and Sociology of Science, University of Pennsylvania) is completing her dissertation on one of America's pioneering power interconnections, "Power to the People: The Development of the Pennsylvania-New Jersey-Maryland High-Voltage Interconnection, 1920-1970." Her reflections on the working relationship between engineers and historians are elsewhere in this *Newsletter*.

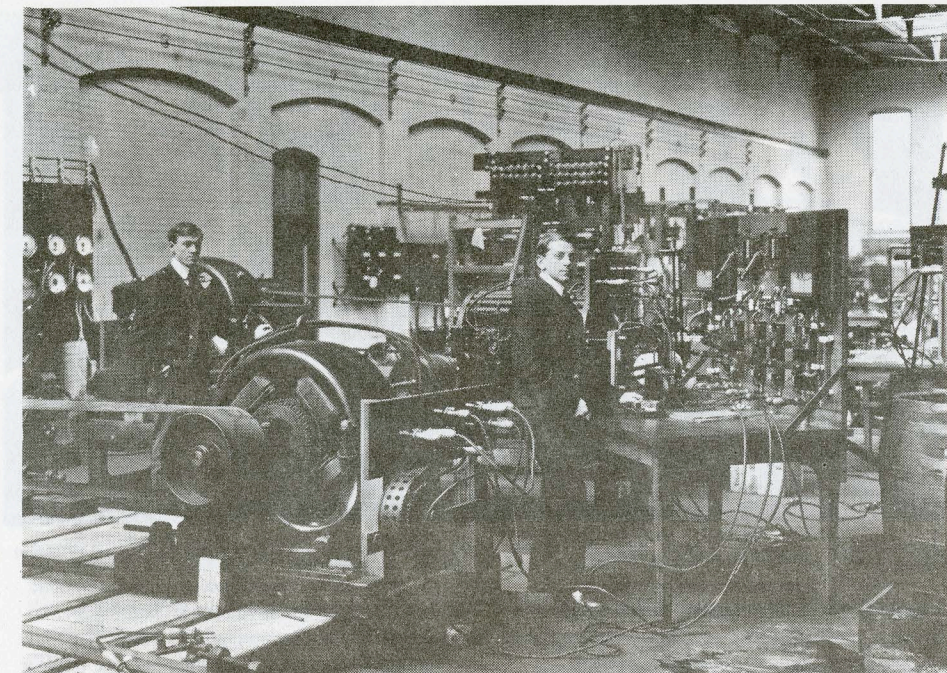
THE CENTENNIAL OF ELECTRICAL ENGINEERING AT M.I.T.

by J.E. Bedi

In the autumn of 1882, Professor Charles R. Cross organized the first course in electrical engineering in the United States, within the Physics Department at M.I.T. Registration in Course VI, as it was named in 1884, became substantial enough to warrant the establishment of a separate Department of Electrical Engineering in 1902. Since its foundation, M.I.T.'s electrical engineering department has benefitted from the involvement of such respected electrical engineers as Dugald C. Jackson, Vannevar Bush, Gordon S. Brown, Harold E. Edgerton and Jay W. Forrester, to name only a few. The multifaceted history of this department was commemorated in the Course VI Centennial Celebration, held at M.I.T. on the weekend of 2-3 October 1982.

The celebration was set in motion on Friday night with the opening of the exhibit, "A Bunch of Electrics: An M.I.T. Electrical Engineering Retrospective", presented by the M.I.T. Museum. The exhibit takes a biographical approach to the first 60 years of M.I.T.'s Department of Electrical Engineering, focusing on various individuals and their contributions to research and to the development of electrical engineering education. A representative collection of artifacts, including galvanometers and electroscopes once used at M.I.T. but now part of the Smithsonian's collections, an 1882 Edison bipolar generator given by Edison to the Institute, part of Vannevar Bush's differential analyzer and the memory core of Whirlwind I, an early high-speed digital computer, are combined with photographs, theses, archival material and written information to portray the diverse activities of the Department. Included in the introduction to the exhibit was the announcement of the production of a history of electrical engineering at M.I.T. This book, commissioned by the Department of Electrical Engineering in cooperation with the M.I.T. Press, is being authored by Professor Emeritus Karl Wildes and writer Nilo Lindgren, based on notes and interviews collected by Professor Wildes during the past two decades. The volume is currently in press.

A symposium on "Lifelong Cooperative Education" was held on Saturday. The report on this topic, the culmination of a year-long study sponsored by the Department of Electrical Engineering, highlighted the need for continuing education for electrical engineers and



Dynamo room of the M.I.T. Electrical Engineering Department's Lowell Building, about 1910. The M.I.T. Museum.

computer scientists who face early professional obsolescence due to the rapid technological changes that occur in their profession. Robert E. Larson, IEEE president and one of the speakers at the symposium, said that the M.I.T. study could "have a tremendous impact on the electrical engineering profession."

The remainder of the weekend was taken up by a banquet, laboratory visits, a film program entitled "An Oral History of Course VI" which utilized films from the M.I.T. Museum's collection, and a picnic, concluding a celebration which not only noted the achievements of the past but also offered a strategy for the future.

Sorting Out E/E Education in the U.S.

While there's little question that M.I.T.'s Course VI (originally called Course VIII-B) was the first formally organized degree program in electrical engineering in the United States, the chronology of subsequent programs is less clear. Because the 1980's will see the centennials of a number of electrical engineering programs and departments, we hoped to get a better picture of the developments of a hundred years ago by turning to Robert Rosenberg (Dept. of History of Science, Johns Hopkins), whose current research on the beginnings of American electrical engineering education provides us with a well-informed source. The chronology based on Rosenberg's information is as follows:

- 1882- M.I.T. established Course VIII-B, Electrical Engineering, which becomes Course VI in 1884.
- 1883- Cornell establishes an electrical engineering course under William A. Anthony.
- Lehigh renames its Department of Physics the Department of Physics and Electrical Engineering.

- Stevens establishes a Department of Applied Electricity in the Physics Department.
- 1884- Harvard lists its first courses in the "special study of electricity" in the Lawrence Scientific School, referred to as electrical engineering in 1888.
- 1885- Missouri establishes electrical engineering department.
- Purdue establishes course in "Applied Electricity," School of Electrical Engineering formed in 1888.
- 1886- Johns Hopkins institutes program leading to certificate of "Proficiency in Applied Electricity."
- 1887- Pennsylvania State Department of Physics becomes the Department of Physics and Electrotechnics.
- Kansas announces a four-year course in electrical engineering.

Readers with information on the early electrical engineering programs, both in the United States and elsewhere, are invited to communicate with the Center.

The Institute of Electrical and Electronics Engineers

IEEE History Committee - 1983

- | | | |
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Frederick E. Terman (center), with two of his more famous students, David Packard and William Hewlett.

Frederick E. Terman, 1900-1982
Known as the "Father of Silicon Valley," and as one of the most influential electrical engineering educators in America, Frederick

Terman died at his home in Stanford, California on December 19, 1982. Terman was an enthusiastic supporter of the IEEE's efforts to promote the history of electrical

engineering, serving as a member of its History Committee for eight years and as chairman in 1973 and 1974. When proposals were made to expand the IEEE's commitment of resources to historical efforts, Dr. Terman lent his prestigious voice to the cause. He was also instrumental in promoting the fruitful relationship between the History Committee and the IEEE Life Member Fund Committee.

Believing that historical responsibility begins at home, Dr. Terman began in 1977 to donate the voluminous collection of papers that document his more than 50 years as an engineer and educator to the Stanford University Archives. Sensitive not only to the historical importance of a collection that eventually filled more than 200 archives boxes, but also to the burden that processing such a collection presents, Terman underwrote the costs of handling and organizing the materials through a grant to the Archives. The result is one of the most useful and important resources for documenting the history of electronics technology.

BRIEFS

IEE Wiring Regulations

The centenary of the Wiring Regulations of the Institution of Electrical Engineers was observed on 21 June 1982. The program included addresses by Sir Francis Tombs, President, IEE, and by David Mellor, Parliamentary Under Secretary of State of Energy; a review of "100 Years of the IEE Wiring Regulations" by Dr. Brian Bowers, Deputy Keeper, Department of Electrical Engineering, the Science Museum; and an exhibition chronicling 100 years of electrical installation practice.

"History of Computing" Lecture

The Science, Education and Technology Division of the Institution of Electrical Engineers sponsored a lecture entitled "The History of Computing in the 20th Century," which was presented by J. Howlett at the IEE, London, on 19 January 1983. Mr. Howlett had attended the International Research Conference on the History of Computing in Los Alamos, New Mexico, in June 1976, as had many computer pioneers, and the discussions and papers from that conference formed the basis for the lecture. Mr. Howlett also addressed the question of the desirability and feasibility of producing an authoritative history of British computing.

History of Computers on Video

A \$150,000 grant from the Sloan Foundation will enable the Massachusetts Institute of Technology's Research Program on Communications Policy to produce an archive of histories of pioneers in the field of digital computers. The evolution of stored-program digital computers, the development of interactive computing during the 1950s and 1960s, and the introduction of commercial data processing have been selected as the subjects for the first videotape.

STC Centenary

To mark its centenary in 1983, Standard Telephones and Cables PLC has planned a program of events focusing on the theme of communications. One part of this program is the presentation of the 1982/83 Institution of Electrical Engineers Faraday Lecture. Titled "The Photon Connection," the lecture deals with Michael Faraday's discovery of electro-magnetic induction as the basis for the evolution of optical communication. "The Photon Connection" is being presented in fifteen cities in the United Kingdom between 5 October 1982 and 23 March 1983.

Associate Director Appointed at Babbage Institute

Dr. Dale Martin Johnson, Senior Lecturer in Mathematics at Hatfield Polytechnic, United Kingdom, has been appointed Associate Director at The Charles Babbage Institute for the History of Information Processing at the University of Minnesota, Minneapolis. Dr. Johnson, a graduate of the University of Chicago and the London School of Economics, will be involved in all aspects of the Institute's activities, but will be particularly concerned with archival and data-base analysis programs.

New Director at Bakken Library

The Bakken Library of Electricity in Life, in Minneapolis, which collects, conserves, organizes and utilizes printed, recorded and artifactual material "documenting the history of electricity as a cultural force and as a tool and object for the study of life in health and disease," has appointed John Edward Senior as its new Director. Mr. Senior has an academic background in medical technology and the history of science as well as museum expertise, having served as Curator of the Royal Ontario Academy of Medicine and of the Museum of the History of Medicine, both in Toronto.

NEW PUBLICATIONS

The Newsletter's "Publications" section has been prepared by Ronald R. Kline, Department of the History of Science, University of Wisconsin—Madison, and Robert Casey of the Center staff.

Books

Dirk Hanson. *The New Alchemists: Silicon Valley and the Microelectronics Revolution*. Boston: Little, Brown, 1982. 384 pages. A comprehensive look at the origins and effects of microelectronics. The first half of the book is devoted to the history of electronics and computers, the rise of the electronics industry, and the development of Silicon Valley. In the second half of the book Hanson discusses the impact of the applications of the technology: consumer electronics, home computers, telecommunications, automation, and military electronics. Dirk Hanson is a journalist specializing in business and high technology. He spent three years covering Silicon Valley and the microelectronics industry for *Electronics News*.

Alexander Lurkis. *The Power Brink: A Centennial of Electricity—Con Edison*. Hollis, N.Y.: Icare Press, 1982. 207 pages. An examination of Consolidated Edison by one of the utility's major critics. Lurkis traces the development of electric power production in New York from Pearl Street and Niagara Falls to the present. He sees the past 20 years of Con Ed's operation as marked by bad technical judgement, declining system reliability, and rising costs. He is especially critical of the "Big Allis" 1GW generator, the Indian Point and Ravenswood Nuclear Plants, and the proposal for the Storm King Pumped Storage Plant. Alexander Lurkis (SM IEEE) is a retired Chief Engineer of the New York City Bureau of Gas and Electricity.

Ole Immanuel Franksen. *H. C. Ørsted—A Man of the Two Cultures*. Birkerød, Denmark: Strandbergs Forlag, 1981. 49 pages.

A summary of the career of the discoverer of electromagnetism with emphasis upon his belief in the unity of science and art. His philosophy of "the Soul in Nature" spurred him on in his scientific work, contained the seeds of the principle of energy conversation, and influenced Danish poets and authors like Hans Christian Andersen. Ole Franksen (F IEE; M IEEE) is an Associate Professor in the Electric Power Department of the Technical University of Denmark.

Philip Cantelon and Robert C. Williams. *Crisis Contained: the Department of Energy at Three Mile Island*. Carbondale, Illinois: Southern Illinois University Press, 1982. 213 pages, illustrated.

This book was commissioned by the Department of Energy to document the Department's activities following the TMI accident. The authors conclude that the accident was due more to human error than technological failure. Included is an appendix listing all personnel involved in assessing the accident, and a chronology of events. The authors are contract historians based in Gaithersburg, Maryland.

Joan Lisa Bromberg. *Fusion: Science, Politics, and the Invention of a New Energy Source*. Cambridge, Mass.: MIT Press, 1982. 344 pages, illustrated. A history of fusion energy research from 1951 to 1978, based on government and laboratory archives, files of participants in fusion research, and interviews with scientists, engineers, and administrators. The book focuses on the programs that have received the majority of Federal funds spent on fusion: Lawrence Livermore National Laboratory, Los Alamos Scientific Laboratory, Oak Ridge National Laboratory, and the Princeton Plasma Physics Laboratory. Bromberg discusses the effect of political forces upon scientific endeavors, noting that "the major decisions in fusion research have always emerged from a medley of technical, institutional, and political considerations." (p. 2). Joan Bromberg wrote *Fusion* for the U.S. Department of Energy, and is now director of the Laser History Project.

George Brown. *And Part of Which I Was: Recollections of a Research Engineer*. Princeton Junction, N.J.: Angus Cupar, 1982.

A memoir of the development of television by a leading participant. George Brown developed the Turnstile antenna for FM and television, and was leader of the team of RCA engineers which successfully struggled for compatible color television standards. George Brown (LF IEEE) retired from RCA in 1972 as Executive Vice President, Patents and Licensing, and a Member of the RCA Board of Directors.

Leslie Hannah. *The First Fifteen Years of Nationalised Electricity in Britain*. London/Basingstoke: Macmillan Press; Baltimore: The Johns Hopkins Univ. Press, 1982. 336 pages.

Continuing the story begun in *Electricity before Nationalisation*, Hannah examines the social, economic, political and technological implications of nationalizing Britain's power industry. Covering the years from 1947 to 1962, Hannah's work illustrates the influence of politics upon the policies of the industry. Decisions regarding decentralization, new leadership, increased profitability, and large-scale investment in nuclear energy were strongly influenced by political considerations. By intertwining business, economic, and political history, the author demonstrates how the power industry's pricing and investment strategies evolved from confrontations and cooperation among the politicians, technologists, and bureaucrats responsible for the industry. Hannah includes an epilogue covering the second fifteen years of nationalization, 1962-1978. Leslie Hannah is Professor of Business History at the London School of Economics.

Dorothy Harley Eber. *Genius at Work: Images of Alexander Graham Bell*. New York: Viking Press, 1982. 192 pages, illustrated.

A heavily illustrated compilation of interviews with those who knew Bell in Baddeck, Nova Scotia, where he had his summer laboratory from 1885 to 1922. Dorothy Eber is the author of *The Computer Centre Party* and the editor of several books about Eskimo life.

Articles

Andrews, E. G. and H. W. Bode, "Use of the Relay Digital Computer," *Annals of the History of Computing*, 4 (1982), 5-13.

Andrews, E. G., "Telephone Switching and the Early Bell Laboratories Computers," *Annals of the History of Computing*, 4 (1982), 13-19.

Bennet, William R., "Secret Telephony as a Historical Example of Spread-Spectrum Communication," *IEEE Transactions on Communications*, Com-30, no. 5 (January 1983), 98-104.

Bezillia, Michael, "Steam Railroad Electrification in America, 1920-1950: The Unrealized Potential," *Public Historian*, Winter 1982, pp. 29-52.

Brown, D. Clayton, "North Carolina Rural Electrification: Precedent of the REA," *North Carolina Historical Review*, 59 (1982), 109-124.

Cahan, David, "Werner Siemens and the Origin of the Physikalisch-technische Reichsanstalt, 1872-1887," *Historical Studies in the Physical Sciences*, 12 (1983) 253-283.

Carlson, W. Bernard, "Innovation in Medical Technology: Elihu Thomson, General Electric, and X-Rays in 1896," *Medical Instrumentation*, 16 (July-August 1982), 218 ff.

Cooper, M. L. and V. M. D. Hall, "William Robert Grove and the London Institution, 1841-1845," *Annals of Science*, 39 (1982), 229-254.

Deakin, Michael A. B., "The Development of the Laplace Transform, 1737-1937—II. Poincare to Doetsch, 1880-1937," *Archive for History of Exact Sciences*, 26 (1982), 352-381.

Feng, Cizhang, "Electrical Engineering Education in the People's Republic of China," *IEEE Transactions on Education*, E-25 (May 1982), 54-56.

Frank, Robert L., "History of Loran-C," *Navigation*, 29 (1982), 1-6.

Harrison, Arthur P., Jr., "The World versus RCA: Circumventing the Superhet," *IEEE Spectrum*, 20, no. 2 (February 1983), 67-71.

Holst, P. A., "George A. Philbrick and Polyphemus—The First Electronic Training Simulator," *Annals of the History of Computing*, 4 (1982), 143-156.

Jabs, Carolyn, "The Little Power Plant that Could," *Historic Preservation*, March-April 1982, pp. 46-51.

Jordan, D. W., "The Adoption of Self-Induction by Telephony, 1886-1889," *Annals of Science*, 39 (1982), 433-461.

(Continued on next page)

NEW PUBLICATIONS (cont.)

- Laithwaite, Eric, "Miles Walker—A Pioneer at Met-Vick and UMIST," *Electrical Review* (London), 211, no. 12 (Oct. 15, 1982), 33-34.
- LeMahieu, D. L., "The Gramophone: Recorded Music and the Cultivated Mind in Britain between the Wars," *Technology and Culture*, 23 (1982) 372-391.
- Mayo, John S., "Evolution of the Intelligent Telecommunications Network," *Science*, 215 (February 1982), 831-837.
- Mazusan, George T., "Atomic Power Safety: The Case of the Power Reactor Development Company Fast Breeder, 1955-1956," *Technology and Culture*, 23 (1982), 342-371.
- McGinn, Robert E., "Stokowski and the Bell Telephone Laboratories: Collaboration in the Development of High-Fidelity Sound Reproduction," *Technology and Culture*, 24 (1983), 38-75.
- Morgan, James P., "The First Reported Case of Electrical Stimulation of the Human Brain," *Journal of the History of Medicine*, 37 (1982), 51-64.
- Price, Robert, "Further Notes and Anecdotes on Spread-Spectrum Origins," *IEEE Transactions on Communications*, Com-31, no. 1 (January 1983), 85-97.
- Schelle, Anton, "100 Jahre Hochspannungübertragung: Die Anfänge der elektrischen Kraftübertragung," *Elektrotechnische Zeitschrift*, 103, no. 15 (1982), 876ff.
- Schofman, J., "The Dutch Contribution to Barrier-Layer Semiconductors in the Pre-Germanium Era," *Janus*, 69 (1982), 1-28.
- Scholtz, Robert A., "The Origins of Spread-Spectrum Communications," *IEEE Transactions on Communications*, Com-30, no. 5 (May 1982), 822-854.
- Scholtz, Robert A., "Notes on Spread-Spectrum Communications," *IEEE Transactions on Communications*, Com-31, no. 1 (January 1983), 82-84.
- Slotnick, Daniel L., "The Conception and Development of Parallel Processors—A Personal Memoir," *Annals of the History of Computing*, 4 (1982), 20-30.
- Spina, S. F., "The Spinograph: The 'Disc' Motion Picture Viewer and Projector," *History of Photography*, 6 (1982), 78-81.
- Stern, Nancy, "The Eckert-Mauchly Computers: Conceptual Triumphs, Commercial Tribulations," *Technology and Culture*, 23 (1982), 569-582.
- Wise, George, "Swan's Way: A Study in Style," *IEEE Spectrum*, 19, no. 4, (April 1982), 66-70.

MEETINGS

The Institution of Electrical Engineers, U. K.

The Science, Education and Technology Division of the IEE has an active program of meetings and lectures on the history of electrical engineering. The following lectures are to be held at the IEE, Savoy Place, London:

24 March 1983
 "Sir David L. Salomons Bt. (1851-1925) — No Ordinary Intellect," J. M. C. Wheeler (Chairman of the Sir David Salomons Society); 5:30 PM, tea at 5:00 PM.

20 April 1983
 "Confusing Choices in the Early Days of Electric Traction," A. W. Bond (London Chamber of Commerce); 6:00 PM, tea at 5:30 PM. Joint meeting with the Centenary of Electric Railways Committee.

A "History of Electrical Engineering Weekend" will be held at the University of Birmingham from 15-17 July 1983. The provisional program is as follows:

Friday 15 July
 Evening: 7:45 PM
 "British Sea Mining During World War II," R. C. R. Brooke

"The Electrical Units in the 1880's," A. C. Lynch
 "The Rheotome," V. Phillips

Saturday 16 July
 Morning: 9:30 AM
 "History of Electroplating in Birmingham," C. A. Smith

"The Edmonton Refuse-fired Electricity Generating Plant," N. Barnes
 "Electrical Conductors from Faraday to Ferranti," R. M. Black

Afternoon: Visit—details to be confirmed, probably one electrical, one non-electrical.
 Evening: 7:45 PM

"Joseph Chamberlain and the First Electric Lighting Act," B. Bowers
 "Accumulator Tramcars of the Birmingham Central Tramways," J. S. Webb

"Demonstration of Early Baird TV Receivers," C. E. Ramsbottom

Sunday 17 July
 Morning: 9:30 AM
 "The Transition from Reciprocating Engines to Turbines in Electricity Generation," J. L. Wood

"Early Two-phase Electricity Distribution in the West Midlands," A. E. Price
 "Early History of the Derbys & Notts Electric Power Company," P. Strange

"Early History of Ferro-magnetic Materials," K. G. Beauchamp

Further information on these meetings may be obtained by writing:
 Groups Officer LS(SG)
 SET Division
 IEE
 Savoy Place
 London, England WC2R OBL

Museum of Science and Industry, Chicago

As part of its Fiftieth Anniversary celebration the Museum of Science and Industry is sponsoring a conference entitled "Where are We Going? Critical Issues in Science and Technology." The Conference runs from 4-5 April 1983. Historians of technology participating include Daniel Kevles, Everett Mendelsohn, David Joravsky, Leo Marx, Melvin Kranzberg, and Dorothy Nelkin. The program includes two panel discussions on Information Systems, focusing on microelectronics, communications, computers, and robotics. For further information, write:
 Museum of Science and Industry
 57th Street and Lake Shore Drive
 Chicago, Illinois 60637

The Computer Museum

The Computer Museum will hold a symposium on archives for the history of information processing on 5-6 May 1983. The symposium will serve as an exchange of ideas on archival activities at the museum and in libraries, government agencies, corporations, universities, and by individuals. Anyone desiring information should contact:
 Chris Rudomin
 The Computer Museum
 One Iron Way
 Marlboro, Mass. 01752
 (617) 467-7570

IEEE Region 3

SOUTHEASTCON '83, a conference sponsored by IEEE Region 3, will include a session entitled "Electrical Engineering History: Toward the IEEE Centennial." Three papers will be presented:
 "The IEEE Center for the History of Electrical Engineering," Robert Friedel, IEEE.
 "The Importance of Engineering Landmark Programs," J. Paul Hartman, University of Central Florida
 "Westinghouse — A Centennial: 1886-1986," Charles A. Ruch, Westinghouse Electric Corp.

SOUTHEASTCON '83 will be held from 10-14 April 1983, in Orlando, Florida.

ENGINEERS AND HISTORIANS: A RESEARCH RELATIONSHIP

by Bayla Singer

Bayla Singer, of the Department of History and Sociology of Science at the University of Pennsylvania, Philadelphia, is completing her PhD dissertation on the history of the PJM Interconnection this spring. At our invitation, she has submitted the following observations on the interaction between historians and engineers in interpreting the history of a modern technological development.

Engineers and professional historians share an interest in the history of technology, both for the enlightenment of the general public and the enrichment of engineers' understanding of their profession. While several engineers have successfully written of events and activities in which they were active participants, other working engineers may not have the time or inclination to write such accounts, nor the perspective to relate their experiences to the overall development of their fields. Above all, they may be unaware of the interest that "outsiders" may have in their work. These working engineers

can, however, provide essential and invaluable resources to the professional historian working on twentieth-century technological history. Research for a recent dissertation on the history of the Pennsylvania-New Jersey-Maryland Inter-Connection (PJM), a pioneer high-voltage transmission network, illustrates this point.

One essential service engineers can provide is assistance in identifying and locating primary material. The PJM in its original form was established in the late 1920s, a time for which little manuscript material survives in the archives of companies or government regulatory agencies. Engineer-managers of the PJM (now mostly retired) granted interviews and provided printed material which indicated (a) connections between the Interconnection's formation and certain national and local political developments, (b) some possible reasons for the success of the Interconnection, in contrast to some other plans which had not come to fruition, and (c) some factors important in the reorganization and expansion of the Interconnection in 1956. This material led in turn to an inquiry at the Herbert Hoover Presidential Library, a trip to that library in West Branch, Iowa, and further research at the Franklin D. Roosevelt Presidential Library in Hyde Park, NY, and at the National Archives and Library of

Congress in Washington, DC. The significance of these materials might not have been apparent, even if they had come to the researcher's attention by other means, without reinforcement from the interviews.

A second service, closely related to the first, is provision of an "insider's" view of the material. This gives the researcher, who is not yet intimately familiar with the nuances of the development of the subject, a perspective unobtainable from printed sources. Combination of several such perspectives, in this age of increasing specialization, can lead to an improved understanding of the whole subject. Many instances occurred in the course of the PJM research. In one, comments made by engineers employed by state and federal government regulatory agencies led to a clearer picture of the relationship between the Interconnection and the various government agencies which have jurisdiction over its members. In another instance, comments made by Interconnection engineer-managers corrected erroneous impressions of the "suddenness" of the 1956 reorganization.

These concrete services are in addition to the obvious, the provision of color and flavor, intangible but essential elements of any history.

The Newsletter of the IEEE Center for the History of Electrical Engineering is sent three times a year free of charge to engineers, historians, and others with an interest in the history of electrical science and technology. If you wish to be certain of receiving later issues, please take the time to fill out the form below and mail it to the Center (if you have not yet done so).

Name _____
 Address _____

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EXHIBITIONS AND MUSEUMS

Engineerium

A new Museum is in the planning stages in Canada on the banks of the Niagara River within a quarter mile of the Horseshoe Falls. Scheduled to open c. 1985, the Engineerium plans to utilize features of both traditional museums and of science centers in order to investigate the social and technical effects of the expansion of electric power. To this end, historical collections of machinery and appliances will be combined with dynamic, interactive and static displays and with multi-media presentations. The Engineerium will be located in the 1905 Electrical Development Company Generating Station. Additional information may be obtained from J. Carr, Director, Engineerium, P.O. Box 895, Niagara Falls, Ontario, L2E 6V6, Canada.

Atomic Clocks

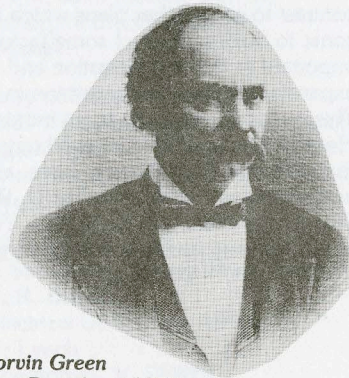
The Smithsonian Institution's National Museum of American History opened an exhibit entitled "Atomic Clocks" in December 1982. The exhibit documents the historical development of atomic frequency and time standards, introducing the topic with such instruments as a 19th century transit to illustrate the standard of time represented by the earth's rotation. The evolution of atomic clocks is then traced through microwaves, atomic beam clocks, optically pumped vapor cell clocks and masers, with the emphasis on the transformation of the scientist's idea into a commercial product. A final section on the uses of atomic clocks concludes the presentation. The exhibit, organized by Paul Forman, Curator of Modern Physics, is intended to remain on view for several years.

The Science Museum, London

March 1983 is the scheduled opening date for the Science Museum's permanent telecommunications gallery. The inaugural exhibit, sponsored by Standard Telephones and Cables PLC, will trace the history of telecommunications from the telegraph to present-day information technology. A film on the future of telecommunications is also being produced as an adjunct to the exhibit. For further information, contact John Stevenson, Education Officer, The Science Museum, Exhibition Road, London, SW7 2DD, England.

Georgia's Electrical Age

An exhibit chronicling the electrical development of the State of Georgia was on view at the Schatten Gallery, Emory University, Atlanta, from 29 April to 20 June 1982. Focusing on the effects of technological change from 1852, when Alexander Means demonstrated an electric light to Oxford College students, to the present and beyond, with a section on Atlanta 2002, the exhibit drew together photographs, artifacts and documents from corporate and academic sources. Panel discussions, lectures, slide shows and an original play were presented in connection with the exhibit.



Norvin Green
First President, AIEE

The rapidly growing art of producing and utilizing electricity has no assistance from any American national scientific society. There is no legitimate excuse for this implied absence of scientific interest, except that it be the short-sighted plea that everyone is too busy to give time to scientific, practical and social intercourse, which, in other professions, have been found so conducive to advancement.

From Nathaniel S. Keith's call for the foundation of an American electrical engineering society, April 1884.

The founding of the American Institute of Electrical Engineers in 1884 is featured in an exhibit at IEEE headquarters. Designed by the Center for the History of Electrical Engineering, the exhibit incorporates documents, books, and photographs from the collections of the IEEE and of the Engineering Societies Library.



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