

IEEE CENTER FOR THE HISTORY OF ELECTRICAL ENGINEERING

Newsletter

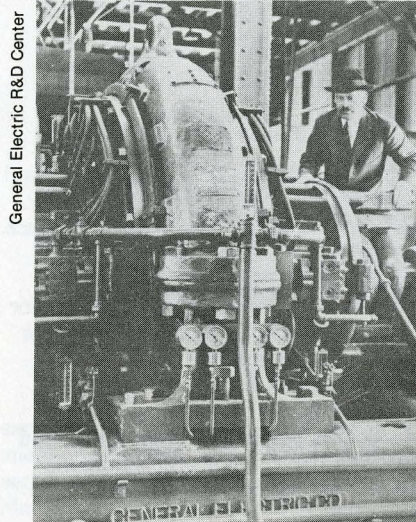
Number 7 Fall 1984

Update on SAMCREST

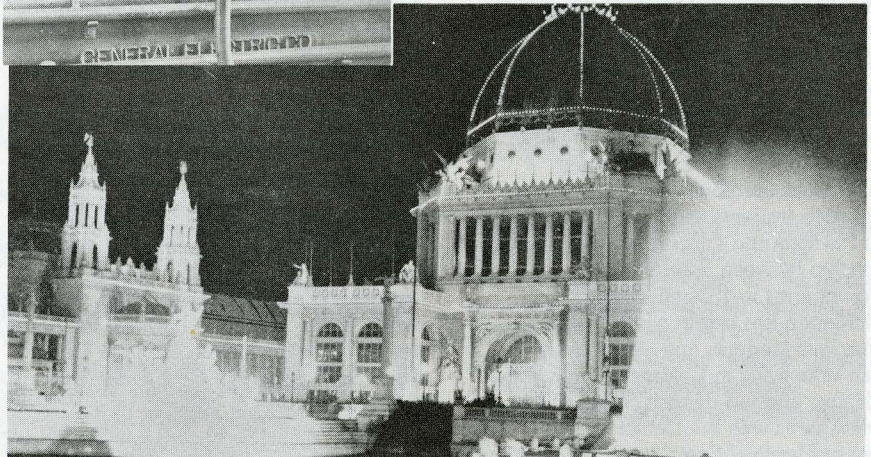
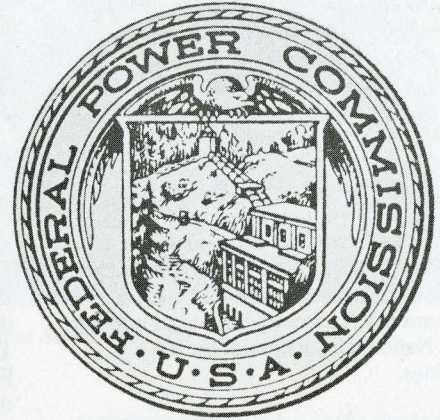
Historians are well aware that unpublished archives and manuscripts are indispensable sources on which to base their interpretations of the rich past of electrotechnology. But electrical engineers, the creators of these records, may not recognize this value of their old papers in an age when rapid changes in science and technology supplant their lifework so quickly. The purpose of SAMCREST (Survey of Archival and Manuscript Collections Relating to Electrical Science and Technology) is to address both of these concerns. It will give historians a comprehensive listing and description of archival collections, and we believe it will encourage engineers to consider depositing their papers with local repositories, such as university archives, historical societies, and similar organizations.

SAMCREST began in 1973 when David Hounshell, with a grant from the IEEE Life Member Fund, prepared the booklet, *Manuscripts in U.S. Depositories Relating to the History of Electrical Science and Technology*. The booklet, which was published by the Smithsonian Institution, was based on a survey of the *National Union Catalog of Manuscript Collections*. In 1981, David Rhees, also financed by the Life Member Fund, updated this listing with replies to questionnaires sent to archivists in colleges, universities, and historical societies in the United States. The result of the work of Hounshell, Rhees, and the staff of the IEEE History Center, who have continued to update SAMCREST, is a listing and description of over 1000 archival collections.

Managing this amount of information has been greatly simplified in the past six months by entering it into a computerized data base. The task is not yet finished, but the Center now has the capability to search the entire data base for specific information and to provide researchers with a printout of the collections pertaining to their particular area of interest. A more detailed description of each collection is now being added to the data base, and the Center is investigating means by which to publish and distribute SAMCREST after the current stage of the project is completed. Periodic supplements are planned to provide an ongoing record of the archives preserved for writing the history of electrical engineering.



General Electric R&D Center



Papers relating to (clockwise) the Federal Power Commission, Ernst F.W. Alexanderson, and the World's Columbian Exposition of 1893 are just three of the collections represented in SAMCREST

Transition

As the new director of the IEEE Center for the History of Electrical Engineering, I am the grateful heir of the excellent organization established by my predecessor, Robert Friedel. Under his leadership, the Center carried out a balanced program of exhibits, archives management, research, and publication to promote the study and understanding of the history of electrical engineering. The philosophy of maintaining this balance in order to serve engineers, historians, and the general public guides the ongoing and planned work of the Center.

Several long-term programs are continuing with the change in directors. The first Electrical Engineering Milestones have been designated (see story on page 3), and two

others are in the preliminary stages of approval. The information garnered from the Survey of Archival and Manuscript Collections Relating to Electrical Science and Technology (SAMCREST), begun in the early 1970s, is being updated and entered into a computerized data base system. And the Friends of the Center for the History of Electrical Engineering is being organized to broaden the scope of the Center's work.

Future programs under consideration are the publication of SAMCREST, the initiation of the archival and oral history stages of the Microelectronics History Project, and a concentrated effort to encourage the establishment of archival collections in industry and in academic electrical engineering departments.

Ronald Kline

WORK IN PROGRESS

Richard Hirsh, Associate Professor at Virginia Polytechnic Institute on leave at the Harvard Business School, is preparing a book on the history of the post-World War II electric power industry. The work treats the technical, economic, and social transformation of the industry in an age when electric power technology reached practical limits. Professor Hirsh is investigating the interrelationships of this technology, business strategies, and "corporate culture" to explain why, after a century of unquestioned success, the industry lost its ability to produce cheap and abundant electricity. The project has been supported by the Harvard Business School and Virginia Polytechnic Institute and by grants from the National Science Foundation and the National Endowment for the Humanities.

A. Michal McMahon is continuing his investigation of the history of electrical engineering education begun in his forthcoming IEEE book, *The Making of a Profession: A Century of Electrical Engineering in America*, by conducting research for a biography of the late Frederick E. Terman. As head of the electrical engineering department at Stanford University, Terman trained such students as William Hewlett and David Packard and encouraged a symbiotic relationship between Stanford and electronics firms in "Silicon Valley." Dr. McMahon has begun a series of oral histories with students and associates of Terman now living in California, New York, and Illinois, and will deposit copies of the interview tapes with the Center for the History of Electrical Engineering. The oral history stage of the project is being funded by a grant from the IEEE Life Member Fund.

Yuko Takahashi, Associate Professor of Electrical Engineering at Tokyo University of Agriculture & Technology, is continuing his study of early electrical societies and their publications. Professor Takahashi presented

a preliminary paper on this subject, "William Sturgeon and the Institutional History of Electrical Engineering," to the Japanese Society of the History of Industrial Technology in November 1983.

Support for Research Available

The IEEE, American Institute of Physics, and AT&T offer financial support to scholars undertaking research in the history of science and technology.

Applications are currently being accepted for the IEEE Fellowship in Electrical History for 1985-86. For the first time, the IEEE Fellowship is open to both pre- and post-doctoral candidates. The closing date for applications is 1 February 1985. Forms and further information are available from the Center for the History of Electrical Engineering.

The American Institute of Physics Center for History of Physics is continuing its program of small grants-in-aid for research in the history of 19th and 20th century physics and astronomy and their social interactions. Grants will be for a maximum of \$1000 each and can be used only to reimburse direct expenses connected with research. Preference will be given to those who need the funds for travel to use the resources of the Center's Niels Bohr Library in New York City, or to microfilm papers or conduct tape-recorded oral history interviews with a copy deposited in the Library. Applicants should either be working toward a graduate degree in the history of science, or show a record of publication in the field. To apply, send a vitae and a letter describing the research project to Spencer Weart, Center for History of Physics, American Institute of Physics, 335 East 45th Street, New York, NY, 10017.

The Institute of Electrical and Electronics Engineers

IEEE History Committee-1984

Harold Chestnut, Chairman
Thomas J. Aprille, Jr.
James E. Brittain
Jan Carr
Donald G. Fink
Bernard S. Finn
F.A. Furfari

Howard B. Hamilton
Edward W. Herold
Reinhard K. Hellmann
David H. Jacobsohn
Nathaniel B. Nichols
Karle S. Packard, Jr.
Erwin Tomash

Center for the History of Electrical Engineering

Ronald Kline, Director
Joyce E. Bedi, Curator
Anne C. Benson, Research Assistant
Address: 345 East 47th Street, New York, NY 10017
Telephone: (212) 705-7501

Applications are also currently being accepted for the AT&T Fellowship in Telephone History. The purpose of the AT&T program is to furnish one year's financial support (\$10,000) for a student to carry out research utilizing information from AT&T's historical business archive in New York City. The fellowship will support doctoral research into the history of the AT&T Company, its predecessor, and associated enterprises. Advanced students who have completed their course work in an accredited university graduate program of business history or related fields are eligible. For further information, contact Robert W. Garnet, Historical Archive & Publications Group, AT&T Company, 195 Broadway, Room 1002A, New York, NY, 10007. Applications for the 1985 fellowship close on 1 April 1985.

MEETINGS

International Congress of History of Science

The XVIIth International Congress of History of Science, the major triennial meeting of historians of technology and science, will be held at the University of California, Berkeley, on 31 July - 8 August 1985. Those wishing further details on this meeting should write to the Congress Secretariat, Office for History of Science and Technology, 470 Stephens Hall, University of California, Berkeley, CA, 94720.

Midwest Junto

The annual meeting of the Midwest Junto for the History of Science will be held April 18-20, 1985, at the University of Minnesota, Minneapolis. For registration materials and other information, write William Aspray, Charles Babbage Institute, 104 Walter Library, 117 Pleasant Street SE, Minneapolis, MN, 55455.

Economic and Business History

The annual meeting of the Economic and Business Historical Society will be held April 22-27, 1985, in Chicago. For more information, contact Professor Allen Bures, Department of Business, Radford College, Radford, VA, 24142.

History & Philosophy of Mathematics

A conference on the History and Philosophy of Modern Mathematics will be held at the University of Minnesota in Minneapolis on May 17-19, 1985. Contact William Aspray, Charles Babbage Institute, or Philip Kitcher, Minneapolis Center for the Philosophy of Science, University of Minnesota, Minneapolis, MN, 55455.

IEEE Names First Milestones

At their August meeting, the IEEE Board of Directors approved the first two IEEE Electrical Engineering Milestones. The telegraph cable station at Heart's Content, Newfoundland, and the site of Marconi's transatlantic radio experiments at Signal Hill, St. John's, Newfoundland, received the honor for their place in communications history.

Heart's Content

On Friday, 27 July 1866, a permanent electrical communications link was established between the old and new worlds, altering for all time the personal, commercial, and political relations between people on both sides of the Atlantic. It had taken two weeks for the *Great Eastern* to lay the 1,852 miles of underwater telegraph cable between Valentia, Ireland, and Heart's Content, on the eastern side of Trinity Bay, Newfoundland. Along with the cable, the ship had carried five operators, employees of the Anglo-American Telegraph Co., to run the station. Within four years, both the number of operators and the number of cables had doubled. Six transatlantic cables in all were completed between Valentia and Heart's Content between 1866 and 1894, and the cable station continued in service for nearly a century.

Signal Hill

Telegraphy's supremacy in transatlantic communication was challenged in 1901, however, by Guglielmo Marconi's



Marconi with the receiving apparatus used at Signal Hill, 1901

experiments with a sensitive coherer, a telephone earpiece, and a 600-foot wire aerial kept aloft by a kite. According to Marconi,

It was shortly after midday on December 12, 1901, that I placed a single earphone to my ear and started listening . . . I was at last at the point of putting the correctness of all my beliefs to the test . . . The chief question was whether wireless waves could be stopped by the curvature of the earth. All along I had been convinced that this was not so, but some eminent men held that the roundness of the earth would prevent communication over such a great distance as across the Atlantic. The first and final answer to that question came at 12:30 . . . Unmistakably, the three sharp clicks

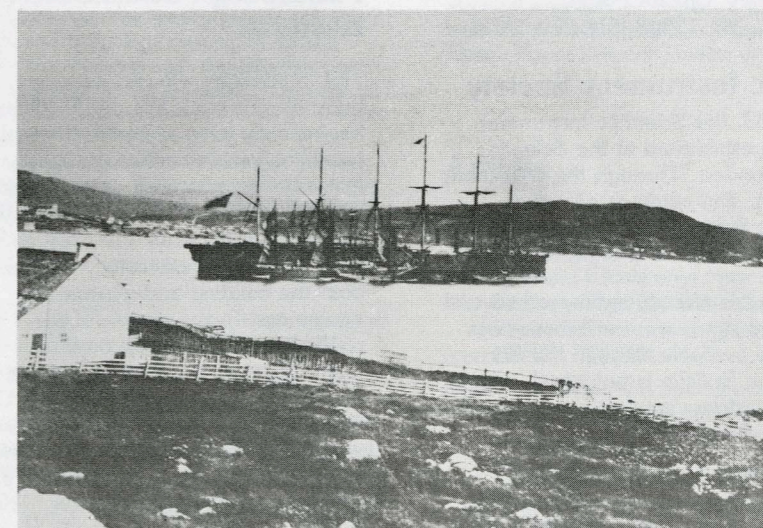
corresponding to three dots sounded in my ear, but I would not be satisfied without corroboration. 'Can you hear anything, Mr. Kemp?' I asked, handing the phone to him. Kemp heard the same thing as I . . . I knew then that I had been absolutely right in my calculations.

Marconi's announcement from Signal Hill was greeted with a combination of excitement and skepticism, but his recording of similar signals, using a Morse inker, a few months later proved that radio waves extended far beyond the horizon, giving radio a new global dimension for communication in the twentieth century.

Both Milestones will be commemorated by the dedication of plaques at the sites, in ceremonies to be organized by the IEEE Newfoundland/Labrador Section.

The Milestones program is designed especially to encourage historical activities at the regional level within the IEEE and to foster cooperation between electrical engineers and local institutions in promoting a broader awareness of the heritage of electrical engineering. The program is a modification of similar activities carried out by the American Society of Civil Engineers and the American Society of Mechanical Engineers. The IEEE's effort, however, focuses less on major structures or buildings, recognizing the smaller physical scale of many of the most important achievements of electrical and electronics technology.

Sections wishing to propose Electrical Engineering Milestones in their area are encouraged to write to the Center for the History of Electrical Engineering for guidelines and nomination forms.



The Great Eastern, off Heart's Content, 1866

A Century of Electricals

One hundred years ago, the first people to call themselves electrical engineers joined together to foster their new profession. Their common belief in the importance of learning about how the electrical world works, and of applying that learning to useful purposes, was evident at the AIEE's first technical session, held at the International Electrical Exhibition during those bright autumn days of 1884, and has served as the unifying bond through the profession's century of growth and change.

A Century of Electricals, a new book produced by the Center for the History of Electrical Engineering and based on the exhibit of the same name, offers a hint of this rich history—who the electricals were, where they came from, how they worked, and what difference they made in the world. Made possible by a grant from Hewlett-Packard, complimentary copies of the



Thomas Edison and Charles Steinmetz, two of the electrical engineers portrayed in *A Century of Electricals*

52-page illustrated book were sent to some 20,000 high schools in the United States. A limited number of copies, however, are still available, by request, from the Center.

Local Centennial Activities Focus on History

The emphasis placed on history during the IEEE Centennial has been especially evident in the activities sponsored by IEEE societies, regions, and sections. Centennial editions of newsletters, magazines and journals have featured historical articles, while several regions and sections compiled histories emphasizing their contributions to electrical engineering. For example, Region 7 (Canada) has produced *Electricity—The Magic Medium* (see the "Publications" section of this *Newsletter*). The East Tennessee Section, however, has taken an extra step by establishing its own archival project. The goal is to gather and organize all available material on the section since its founding, and to place the records in local repositories for public use.

Special events focusing on electrical engineering's history included lectures, audio-visual presentations, and exhibits. In addition to mounting a historical exhibit, the Louisville section organized a session during Southeastcon which featured presentations on the history of Region 3, the Louisville section, and computing, and on Charles Steinmetz's contributions to electrical engineering. Sections from Norway to New Mexico, have used "A Century of Electricals," the slide-tape presentation produced by the Center for the History of Electrical Engineering. Exhibits provided yet a third way to look at electrical engineering history. The Milwaukee section's centennial celebration in May featured 12 exhibits from local industry, the City of Milwaukee, and the Milwaukee School of Engineering, while other groups utilized the poster exhibit, "A Century of Electricals," produced by the Center.

Fallasburg Powerhouse Restored

The Fallasburg Powerhouse, a hydroelectric plant in Lowell, Michigan, has recently been restored, once again providing power to the community. The Powerhouse was built in 1903 and operated into the 1960s, but the twenty years of neglect since the plant shut down took their toll in extensive vandalism to both the building and generating equipment. In the course of the restoration, coordinated by STS Consultants of Northbrook, Illinois, two abandoned 1927 James Leffel & Co. turbines were discovered, overgrown with vegetation. These were cleaned and repaired and, with a 36 ft. head, each turbine now produces 450 kW. The 1927 General Electric generator was also salvaged, and the restored hydroelectric plant was put back into operation.

Stanley's development of ac transformers and an ac transmission system in Great Barrington, Massachusetts, for the Westinghouse Company in the mid-1880s; personal papers; and records of the Stanley Electric Manufacturing Company, which pioneered in high-voltage transmission at the turn of the century, before being purchased by General Electric in 1903. Involved in the transfer of the papers were Samuel Sass, General Electric Librarian in Pittsfield; Ellen Fladger, Archivist at the Schaffer Library; and George Wise, Historian at the General Electric Research and Development Center in Schenectady.

For further information on the collection, contact Ellen Fladger, Special Collections, Schaffer Library, Union College, Schenectady, NY, 12308 (518-270-6278).

Scientific Instrument Society

In April 1983, the Scientific Instrument Society was established at the Science Museum, London. Through the collection, conservation, and study of scientific artifacts, the Society hopes to contribute to historical knowledge and understanding.

The Society has already sponsored several meetings and symposia, the proceedings of which are available through the Society. In addition, a *Bulletin* is published, which prints short articles, meeting reports, and a calendar of events.

Further information on the Scientific Instrument Society may be obtained from Carole Stott, Dept. of Astronomy and Navigation, National Maritime Museum, London, SE10 9NF, England.

BRIEFS

Niagara Society for Industrial History

The Niagara Society for Industrial History was founded in November 1980 to encourage the study of historical technology. The Society has begun publication of a *Bulletin* entitled *The Historical Technologist* which stresses the technological aspect of historically important engineering works. Two issues of *The Historical Technologist* have been published to date, both dealing with the Electrical Development Company Generating Station at Niagara Falls. *Bulletin* No. 1 focused on the industrial archaeology of the generating station, while No. 2 examined the operation and importance of the governors used with the station's hydraulic turbines.

For further information on the Niagara Society for Industrial History, contact Robert D. Barnett, Chairman, Niagara Society for Industrial History, 6776 Willinger St., Niagara Falls, Ontario, Canada, L2J 2B3.

William Stanley Papers Transferred

The papers of William Stanley (1858-1916), a prominent inventor of alternating current (ac) systems, have been moved from the William Stanley Library at the General Electric Company at Pittsfield, Massachusetts, to the Schaffer Library, Union College, Schenectady, New York.

The collection, covering the period from about 1882 to 1910, contains notebooks of

NEW PUBLICATIONS

The *Newsletter's* "Publications" section was prepared by Ronald Kline and Anne C. Benson with the assistance of Thomas J. Higgins of the University of Wisconsin.

Books

Volker Aschoff. *Geschichte der Nachrichtentechnik*. New York: Springer-Verlag, 1984. 280 pages.

Aschoff has written a history of communications and communication technology from its beginnings in Classical Greece to the French Revolution, relying mainly on original works dating from Homer to Kempelen. The latter half of the book contains a section on early proposals for electrical communication systems.

John Hendry (ed). *Cambridge Physics in the Thirties*. Bristol, UK: Adam Hilger, 1984. 209 pages.

This book is a collection of accounts by 19 physicists of their experimental research in nuclear physics at the Cavendish Laboratory during the early 1930s. Of interest to historians of electrotechnology is a section on high-voltage and high-vacuum research with industrial applications.

Margaret Latimer, Brooke Hindle, and Melvin Kranzberg (eds). *Bridge to the Future: A Centennial Celebration of the Brooklyn Bridge*. New York: New York Academy of Sciences, 1984. 355 pages.

Based on a symposium's proceedings, the New York Academy of Sciences has published this book to commemorate the centennial of the Brooklyn Bridge. The book addresses both the Bridge's and technology's impact on society. Three of the thirty papers in this collection pertain to electrical history: Reese Jenkins, "Elements of Style: Continuities in Edison's Thinking"; Thomas P. Hughes, "The Professional Inventor in the Heroic Age: Elmer Sperry in Brooklyn"; and Richard G. Hewlett, "Science and Engineering in the Development of Nuclear Power in the United States."

Harry Prevy. *Electricity—the Magic Medium*. Oshawa, Ontario: General Printers, 1984. 192 pages.

In recognition of the IEEE Centennial, the Canadian Region of the IEEE has commissioned the writing of this book on the history of Canadian contributions to electrical engineering over the past century. Written in both English and French, the book covers a broad field, ranging from power technology to biomedical engineering.

Woodruff T. Sullivan (ed). *Early Years of Radio Astronomy*. New York: Cambridge University Press, 1984. 421 pages.

Written for both the specialist and layman, this book chronicles the history of radio astronomy from the 1933 Karl Jansky speech, "Electrical Disturbances of Extraterrestrial Origin," to more recent events in the field. The articles presented here by Professor Sullivan were written by many of the major contributors to this relatively new field, most of whom were non-astronomically trained physicists, radio engineers, and technicians. Among the subjects covered are the discovery of solar radio waves, the development of radar astronomy, and the discovery of the quasar and the pulsar.

Dr. Sullivan is Professor of Astronomy at the University of Washington, Seattle, WA.

Karl Wildes and Nilo Lindgren. *A Century in Electrical Engineering and Computer Science at MIT, 1882-1982*. Cambridge, MA: The MIT Press, 1985. 480 pages.

The authors present a history of the MIT Department of Electrical Engineering and Computer Science, including the work of such men as Vannevar Bush, Harold Hazen, and Gordon Brown. The book covers the department's research in the areas of electric power, servomechanisms, circuit theory, communications theory, radar and microwaves, insulation and dielectrics, electronics, acoustics, and computation. The book demonstrates that Vannevar Bush and others had performed significant work in "Computer Science" long before that label was added to the department's name.

A Professor Emeritus at MIT, Karl Wildes has been associated with the Department of Electrical Engineering and Computer Science since the 1920s. Nilo Lindgren is an MIT graduate in electrical engineering. Formerly a scientific/technical journalist, he is now affiliated with the Electric Power Research Institute in California.

Articles

Algar, Joan & Robert Clayton. "Electronics in the G[eneral] E[lectrical] C[ompany] Hirst Research Centre—The First Sixty Years," *Radio & Electronic Engineer*, 54 (1984), 301-317.

Aschoff, Volker. "Ein interessanter nachrichtentechnischer Vorschlag aus dem Jahre 1782," *Nachrichtentechnische Zeitschrift*, 37 (1984), 286-289.

Aspray, William. "Literature and Institutions in the History of Computing," *Isis*, 75 (1984), 162-170.

Atanasoff, John Vincent. "Atanasoff Recalls Early Days of Computers," *SIAM News*, May 1984, 7-8.

Bennett, G.H. "The Evolution of Transmission and Switching for Integrated Services Digital Networks," *Radio & Electronic Engineer*, 54 (1984), 59-63.

Blumtritt, Otto von. "Zum Praxisbezug der Theorienentwicklung in der Elektrodynamik," *Philosophia Naturalis*, 20 (1983), 506-516.

Bowers, Brian. "Historic Power House Rests at Manchester," *Electrical Review*, 215, No. 3 (Aug. 10/17, 1984), 19.

Carlson, W. Bernard. "Academic Entrepreneurship at M.I.T.: Dugald C. Jackson and the Rise of the Electrical Engineering Department, 1907-1930," *Proceedings of the American Society for Engineering Education*, 2 (1984), 488-495.

Cogan, Donard de. "James Graves and the Valencia Telegraph Station," *Electronics & Power*, 30 (1984) 523-528.

Gavroglu, Kostas and Yorgos Goudaroulis. "Some Methodological and Historical Considerations in Low Temperature Physics: The Case of Superconductivity, 1911-57," *Annals of Science*, 41 (1984), 135-149.

Herman, Frank. "Elephants and Mahouts—Early Days in Semiconductor 'Physics,'" *Physics Today*, 37, No. 6 (June 1984), 56-63.

Kahn, David. "Cryptology and the Origins of Spread Spectrum," *IEEE Spectrum*, 21, No. 9 (Sept. 1984), 70-80.

Kline, Ronald R. "Origins of the Issues [in Electrical Engineering Education]," *IEEE Spectrum*, 21, No. 11 (Nov. 1984), 38-42.

Loosli, H.E. "The Development of the Swiss High Performance [Electric] Locomotive—Past, Present and Future," *Sulzer Technical Review*, 66, No. 2 (Feb. 1984), 11-16.

Lurito, Pamela. "The Message was Electric," *IEEE Spectrum*, 21, No. 9 (Sept. 1984), 84-95.

McFarlane, Don. "History of Electric Power in British Columbia," *IEEE Power Engineering Review*, Oct. 1984, 11-13.

Marchini, Laurence. "Parsons' Steam Turbine Generator: 100 Not Out and Bating On," *Electronics & Power*, 30 (May 1984), 406-407.

Meyer, Helmut. "Gleichstromantriebe im Wandel der Zeit," *Elektrotechnische Zeitschrift*, 105 (1984), 980-982.

Pauer, Eric von. "Technologietransfer und industrielle Revolution in Japan, 1850-1920," *Technikgeschichte*, 51 (1984), 34-54.

NEW PUBLICATIONS (cont.)

Pederson, Donald O. "The Origin of the Journal, the Council, and the Conference of Solid-State Circuits," *IEEE Journal of Solid-State Circuits*, SC-19 (1984), 171-173.

Rose, Mark H. "Urban Environments and Technological Innovation: Energy Choices in Denver and Kansas City, 1900-1940," *Technology & Culture*, 25 (1984), 503-539.

Rosenberg, Robert. "The Origins of EE Education: A Matter of Degree," *IEEE Spectrum*, 21, No. 7 (July 1984), 60-68.

Rosenfeld, Azriel. "Computer Vision Research at the University of Maryland: A 20-Year Retrospective," *Pattern Recognition*, 17 (1984), 373-375.

Ryder, John D. "The Way It Was [in Electrical Engineering Education]," *IEEE Spectrum*, 21, No. 11 (Nov. 1984), 39-43.

Sutton, John R. "Organizational Autonomy and Professional Norms in Science: A Case Study of the Lawrence Livermore Laboratory," *Social Studies of Science*, 14 (1984), 197-224.

Vogel, A. "Geschichte und heutiger Stand der Diktiergerate," *Bull. ASE/UCS*, 75 (1984), 599-600.

Zimmermann, Friedrich von. "60 Jahre Radio-Austria AG," *Elektrotechnik und Maschinenbau*, 101 (1984), 409-415.

Dissertations

Carlson, W. Bernard. "Invention, Science, and Business: The Professional Career of Elihu Thomson, 1870-1900." University of Pennsylvania, 1984.

Frost, Robert L. "Alternating Currents: Technocratic Power and Workers' Resistance at Electricite de France, 1946-1970." University of Wisconsin, 1983.

Singer, Bayla. "Power to the People: The Pennsylvania, New Jersey, Maryland Interconnection, 1925-1970." University of Pennsylvania, 1983.

Unpublished Papers

Several papers on electrical history were presented at the 1984 meeting of the Society for the History of Technology:

Allen, Jeanne (Temple University). "Walkie Talkie: World War II Technological Innovation and Postwar Development."

Collins, Patricia H. (University of Cincinnati). "Blacks, Women, and Organizational Change: The Case of Cincinnati Bell."

Frost, Robert L. (Wabash College). "France's 'False Start' in Nuclear Power, 1954-1969."

Hirsh, Richard F. (Virginia Polytechnic Institute and Harvard Business School). "Culture and the Paradigm of Growth in the Electric Power Industry."

Lafferty, William (Wright State University). "Innovation and Diffusion of Magnetic Recording Technology: The Development of Steel Tape Recording in European Radio Broadcasting, 1929-1935."

McMahon, A. Michal (Philadelphia, PA). "Electrical Engineering."

Pershey, Edward J. (Edison National Historic Site). "Eureka! Young Edisons and the Mythology of Invention."

Rosenberg, Robert (Edison Papers). "Artifacts as Documents."

Senior, John E. (Bakken Library). "Electric Images at the Bakken Library of Electricity in Life."

Smulyan, Susan (Yale University). "The Rise and Fall of the Happiness Boys: Sponsorship, Technology, and Early Radio Programming."

Wise, George (General Electric). "The Corporation Chemist: Willis Whitney and General Electric."

Special Issues

IEEE Transactions on Reliability, R-23, No. 1 (April 1984). Centennial issue with historical articles on the IEEE Reliability Society (1949-1984), the mathematical theory of reliability, reliability education, and reliability engineering in regard to electronic equipment, space technology, nuclear power, software, and maintainability.

IEEE Journal of Quantum Electronics, QE-20, No. 6 (June 1984). Centennial issue on the history of quantum electronics, laser theory and doppler effects, nonlinear optics, and lasers.

IEEE Transactions on Industry Applications, IA-20, No. 4 (July/August 1984). Centennial issue on the history of the Industry Applications Society founded in 1972.

IEEE Transactions on Microwave Theory and Techniques, MTT-32, No. 9 (September 1984). Centennial issue containing a history of the Administrative Committee of the Microwave Theory and Techniques Society; 25 historical articles on a wide range of microwave topics in the areas of fundamentals (hardware and theoretical developments), solid state, newer areas, and applications; and an interview with Harold Barlow conducted by Alec Cullen.

IEEE Transactions on Education, E-27, No. 4 (November 1984). Centennial issue with historical articles on the IEEE Center for the History of Electrical Engineering, the IEEE Education Society, the field of computer history, the early electrical work force, Smithsonian exhibits on electricity, electrical engineering education at Rensselaer Polytechnic Institute, and an early textbook on digital circuits. Also included are articles on the Thomas Edison Papers Project and the work of the Historic American Engineering Record in regard to electrical engineering.

IEEE Transactions on Electron Devices, ED-31, No. 11 (November 1984). Centennial issue with historical articles on microelectronics (junction transistor, Czochralski silicon, MOSFET dynamic RAM, Japanese semiconductor industry, and power semiconductors) and electron tubes (magnetrons, cathode-ray tubes, and other microwave tubes).

History of Technology Series

In 1980, the London Science Museum and Peter Peregrinus Ltd. established a joint publication venture in the form of a history of technology series edited by Brian Bowers of the Science Museum. Four books have appeared in the series: P.H. Sydenham, *Measuring Instruments* (1980); V.J. Phillips, *Early Radio Wave Detectors* (1980); Brian Bowers, *A History of Electric Light and Power* (1982); and R.M. Black, *The History of Electric Wires and Cables* (1983). A forthcoming title in the series is *Electricity Supply in Victorian Leeds* by Dr. Poulter.

The books may be ordered from the Peter Peregrinus Ltd./IEE Service Center, 445 Hoes Lane, Piscataway, NJ, 08854.

Technology & Society

The *IEEE Technology and Society Magazine* invites authors to submit papers on the history of electrotechnology (including ethics and professional responsibility). The magazine supplements *Spectrum* and *Transactions on Education* for the publication by the IEEE of historical articles. Prospective authors should send four copies of their manuscript, plus a 100-word abstract, to Professor Norman Balabanian, IEEE Society on Social Implications of Technology, Electrical Engineering Department, 111 Link Hall, Syracuse University, Syracuse, NY, 13210.

Association of Old Crows

At the time of the Japanese attack on Pearl Harbor, on December 7, 1941, I was head of the Department of Electrical Engineering at Stanford University and just finishing a year as president of the Institute of Radio Engineers (now incorporated in the IEEE). On 28 December, three weeks after we entered the war, I received a telephone call from Lee DuBridge who was head of the Radiation Laboratory at MIT in Cambridge, asking if I would call on him as soon as possible to discuss something important. I went to see him and he asked if I would be willing to set up a civilian organization to conduct research into radio and radar countermeasures for all branches of the US armed forces . . . DuBridge felt that this activity would emphasize engineering knowledge in electronics, whereas the Radiation Laboratory was based on physicists including a high proportion of high energy physicists . . . By the early fall of 1942 RRL [Radio Research Lab] had permanent quarters . . . a technical program . . . and a staff of high quality . . . Everything was set for the start of something big.

(Excerpt from an interview with Frederick E. Terman for the Association of Old Crows, 1980)

The importance of the development of radar in the waging of World War II is general knowledge, but sometimes the other side of that effort—namely, jamming the radar signals—gets little attention. To



rectify this, the Association of Old Crows History Committee put together *Radio Countermeasures (RCM)* in 1981. This overview of the National Defense Research Committee's Division 15 tells the story in personal terms, relying on interviews and correspondence with people who were part of the scene.

Division 15 was responsible for the American British Lab (ABL-15) at Great Malvern, England, a test facility at Florosa, Florida, the Airborne Instruments Lab (AIL) at Mineola, Long Island, and the Radio Research Lab, originally at MIT but later moved to Harvard. In addition to running its own facilities, Division 15 sponsored work at independent labs such as Westinghouse, General Electric, and Bell Labs. The Division's work focused on the needs of the Air Force, especially in the European theater of operations. By

the end of the war, it was estimated that the countermeasures developed by Division 15 were responsible for cutting the effectiveness of German anti-aircraft fire through an overcast by 75%.

The Association of Old Crows was founded in 1965 at about the time that much of the documentation on Division 15 was being declassified. With the needed source material now accessible, the Association formed a history committee to research the full story of radio countermeasures during the war. In addition to *Radio Countermeasures (RCM)*, the Association plans to publish a more substantial work in Fall 1984. The volume will run about 325 pages, with over 125 photographs and maps, and will sell for around \$22.

For further information on the work of the Association, contact Armand J. Morin, Chairman, History Committee, Association of Old Crows, 2300 Ninth Street South, Suite 300, Arlington, VA, 22204 (703-920-1600).

Radio History

The North American Radio Archives (NARA) was founded in 1973 to gather and disseminate information on the history of radio, especially broadcast radio. NARA's collections include lending libraries of radio broadcasts, books, magazines, scripts, slides, and other materials related to the history of radio. In addition, NARA issues a quarterly publication, *NARA News*, and a bi-monthly newsletter, *Through the Horn*.

For further information on the activities of the North American Radio Archives, as well as membership applications, contact NARA, c/o Steve Ham, 4418 Irvington, Fremont, CA, 94538.

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 stamp and mail it to the Center (if you have not yet done so).

Name _____

Address _____

Zip/Postal Code _____

IEEE Membership No. (if applicable) _____

EXHIBITIONS AND MUSEUMS

Branford Electric Railway Assn.



Derby Horse Railway electric locomotive in service, 1888

Trolley Museum to Restore Van Depoele Motor

The Shore Line Trolley Museum in East Haven, Connecticut, has begun a project to restore the Van Depoele motor in its Derby Horse Railway electric locomotive. This locomotive began service in July 1888, primarily for the haulage of freight between Derby Dock and the factories at Ansonia. Apart from its age and originality, much of the historical significance of the locomotive's motor lies in the contributions made to the development of electric street railways by Charles Van Depoele.

Van Depoele emigrated from Belgium in 1869, at the age of 23. He soon became a successful manufacturer—of church furniture—who also conducted experiments in electricity. In 1874, he turned his investigations to the problems of electric

traction, testing his first electric tramcar in 1880. Three years later, he gave the first practical demonstration of a spring-pressed under-running trolley. In November 1885, the overhead current feed system, which he had patented in August of that year, was put into operation at South Bend, Indiana. Van Depoele sold his patents to the Thomson-Houston Co. in 1888 and became an "electrician" with that firm. Until 1889, however, he owned the Van Depoele Electric Manufacturing Co. as well. It was to this company that the contract was given to electrify the Derby Horse Railway.

Since the Shore Line Trolley Museum acquired the Derby locomotive in 1982, restoration work on the underframe and car body has been carried out, guided by early photographs. However, in order to get the locomotive running again, the museum needs to raise an estimated \$20,000 for the restoration of the motor. So far, substantial

financial support has come from the Committee for the Restoration of Historic Assets in Connecticut, which has donated \$10,000 to the project. The expertise needed for the restoration will be provided by Alfred Marcus, an electric motor specialist, who will donate his talent to designing new windings for the motor and act as consultant to the project, and by the Schulz Electric Co., New Haven, which will completely rebuild the motor. The museum's goal is to have the locomotive running again, pulling passengers, at its 100th anniversary in July 1988.

The Shore Line Trolley Museum is located at 17 River Street, East Haven, CT, 06512 (203-467-6927), and is open on Saturdays and Sundays, from 11 am to 5 pm.

Franklin Institute Plans New Exhibit

The Franklin Institute Science Museum has received a grant of \$200,000 from the National Endowment for the Humanities for the purpose of integrating historical elements into the Museum's new permanent exhibition on electricity and electronics, scheduled to open in December 1985. Early experiments and devices will be used as tools for demonstrating simply and clearly the principles they were designed to explore. For example, a Faraday coil from the Museum's collection and a working reproduction of it will be central to the demonstration of electromagnetic induction. Factors influencing the development of electrical technology and its widespread adoption will also be integrated into the exhibit. Thomas Parke Hughes, W. Bernard Carlson, and Andre Millard will be advisors to the exhibit; Bayla Singer of the Science Museum will coordinate the project.



Center for the History of Electrical Engineering
Institute of Electrical and Electronics Engineers
345 East 47th Street, New York, NY 10017

Non Profit Org.
U.S. Postage
PAID
IEEE
Permit #52