

IEEE CENTER FOR THE HISTORY OF ELECTRICAL ENGINEERING

Newsletter

Number 5 Spring 1984

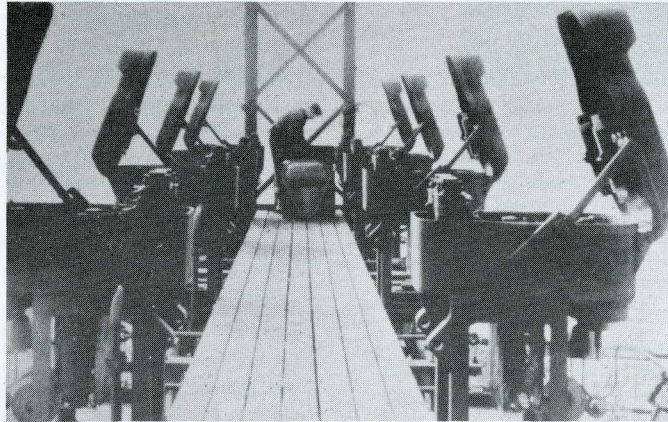
Milestones and Friends Mark New Outreach Efforts

As part of its effort to broaden involvement in the historical activities sponsored by the IEEE, the IEEE History Committee has announced two programs that it will launch in 1984. The *Electrical Engineering Milestones* program aims to foster historical activities at the local level, while the formation of the *Friends of the Center for the History of Electrical Engineering* is to provide a support mechanism for the work of the Center.

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 that have been long carried out by the American Society of Civil Engineers and the American Society of Mechanical Engineers. The IEEE's effort will focus less on major structures or buildings, recognizing the smaller physical scale of many of the most important achievements of electrical and electronics technology.

The IEEE will continue to cooperate with other engineering societies in joint designations when appropriate. A recent example of such an effort was the designation of the 1907 electrification of the New York, New Haven, and Hartford Railroad as a historic engineering landmark by the IEEE and the ASME in 1982.

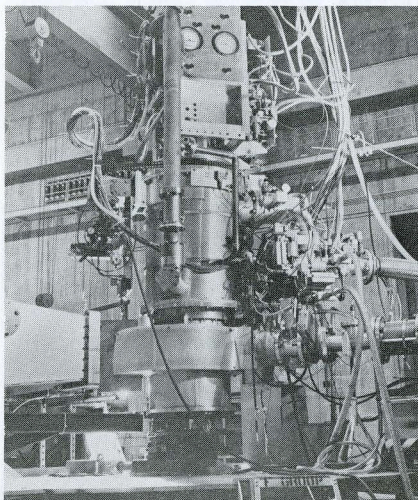
The *Friends of the Center for the History of Electrical Engineering* will be an important addition not only to the outreach mechanisms of the Center but also to the sources of assistance for IEEE historical projects. Looking beyond the current activities related to the observance of the IEEE Centennial, the History Committee has concluded that the Center's ability to carry out major efforts in the future depends on the identification and utilization of a group of individuals who have an active and continuing interest in the Center's work and in the history of electrical science and technology in general. The readership of this *Newsletter*, now roughly 1,000 (not including special distributions), constitutes the most obvious source of potential membership for the organization, although efforts will reach further.



ASME

Inspecting the overhead catenary wire during construction of the electrification system for the New York, New Haven and Hartford Railroad, 1905-1907

Both the *Milestones* and the *Friends* programs have been approved by the IEEE Executive Committee, and the development of organizational details has been delegated to the History Committee's Long Range Planning Committee, chaired by Prof. James Brittain of the Georgia Institute of Technology. Details on the nomination procedures for *Milestones* can now be requested from the Center, and further announcements on the organization of the *Friends* will be soon forthcoming.



ASME

A liquid hydrogen target reservoir at the Stanford Linear Accelerator Center. SLAC was designated a National Historic Engineering Landmark in February 1984 by the ASME and the IEEE San Francisco Bay Area Council.

Microelectronics as History

No technology in the 20th century has developed more rapidly or with broader implications for the future than microelectronics. When, little more than 35 years ago, engineers discovered how to reduce the most basic electronic components to tiny size, no one could foresee the enormous impact of the achievement. We now know that the transistor and its successor microelectronic components—especially integrated circuits—opened the way to a new technological world. The possibilities this new world presents are today manifested in every area of our lives, from automobiles to guided missiles, toys to computers, wristwatches to satellites. The Smithsonian Institution's National Museum of American History, in cooperation with the IEEE, has launched a special effort to identify and collect the most significant artifacts of the microelectronics revolution. Companies, laboratories, and individual scientists and engineers are being asked to seek out important pieces of evidence that mark the progress of the new technology and its applications. The first fruits of this effort were revealed in an exhibit which opened at the National Museum of American History on 23 February. The exhibit was prepared by Bernard Finn, curator in the Museum's Division of Electricity and Modern Physics, and Robert Friedel, director of the IEEE Center for the History of Electrical Engineering. Early transistors, chips, and other components are included in the exhibit, as well as such early examples of the application of microelectronics as radios, calculators, and musical instruments.

WORK IN PROGRESS

Note: one the primary functions of this *Newsletter* is to serve as a means for exchanging information about current activity in the history of electrical engineering, wherever it may be taking place. Readers are invited to inform the Center about their current research or any other active work which they believe would be of interest to readers.

James E. Brittain, School of Social Sciences, Georgia Institute of Technology, is the Guest Editor of a special theme issue of the *IEEE Transactions on Education*, scheduled for publication in November 1984. The issue will contain several invited papers that will report on activities and long-range goals of a number of centers and other institutions that currently are active in the field of electrical engineering history. The issue also will contain contributions dealing with the history of electrical engineering education during the past one hundred years.

Other special Centennial issues of IEEE publications that may be of interest for their historical content include *IEEE Communications Magazine* (May 1984) and the *Engineering in Medicine and Biology Magazine* (December 1984), as well as the following *IEEE Transactions*: *Consumer Electronics* (May 1984), *Electron Devices* (November 1984), *Industry Applications* (May/June 1984), *Magnetics* (July 1984), *Microwave Theory and Techniques* (September 1984), *Quantum Electronics* (June 1984), and *Solid-State Circuits* (April 1984).

Stuart W. Leslie (Department of History of Science, Johns Hopkins) is continuing his research on the relationship between the development of the electronics industry on the San Francisco peninsula and the engineering program at Stanford University.

Bruce Hunt (Department of History of Science, Johns Hopkins) is completing his dissertation on the development of Maxwellian physics in late-nineteenth-

century Britain. His work on this topic has included special attention to the work of Oliver Heaviside.

Ronald R. Kline (Dept. of General Engineering, Univ. of Wisconsin-Madison) is researching the relationship between theory and practice in the development of the induction motor from Tesla to Behrend. He completed his doctoral dissertation in 1983 on the life and career of Charles Proteus Steinmetz.

A. Michal McMahon (Philadelphia, PA) will be following his history of the electrical engineering profession in America, sponsored by the IEEE as a Centennial project and to be published later this year by the IEEE, Press, with a centennial history of the Association of Edison Illuminating Companies.

The Women's Committee of the History of Science Society is preparing a third *Directory of Women in the History of Science, Medicine, and Technology*. The *Directory* is an important tool for developing a network of women historians. The Committee predicts use of the directory by search committees, directors of conferences and lecture series, and by independent and institutional scholars. The *Directory* was first published in 1977 and revised in 1982. To compile data for the third edition, questionnaires are being distributed to as wide an audience as possible. Women who wish to be included in the *Directory* may obtain questionnaires from Prof. Alice Stroup, Women's Roster, Dept. of History, Bard College, Annandale-on-Hudson, NY, 12504 (914-758-6822).

Electrical History In South Africa

Historical efforts in electrical engineering are being fostered by the South African Institute of Electrical Engineers, which celebrates its 75th anniversary this year. P. Man in 't Veld, chairman of the SAIEE Historical Interest Group, writes:

"One of the aims of the Historical Interest Group (HIG) is to locate, preserve and if possible, to collect equipment and documentation of historical value in the electrical engineering field and ultimately to secure official backing for an Engineering Museum in South Africa.

"Being an Interest Group of the SAIEE we concentrate on electrical items, but we are sure that Institutes of other engineering disciplines will join us in a concerted effort to get a National Engineering Museum established. The real importance of such a museum is that it will stimulate our youngsters to become the engineers of the future, which this country will need so badly. Moreover it will enhance the appreciation of our heritage in the engineering profession.

"The HIG, through the extensive circulation of a questionnaire, has already located numerous items of historical value. Certain equipment and documentation has already been donated for a future museum. A major organization has kindly provided temporary storage space. One of the members of the HIG has taken upon his shoulders the cataloguing of vital data on the equipment, using his personal computer. Through the SAIEE, the HIG has registered as an institutional member of the Southern African Museums Association.

"We are sure that there are lots of items of historical value all over the country which are unknown to us. Every day older equipment is replaced and libraries are cleared to make space for modern literature. With the turbulent developments in electronics this will take place more and more rapidly. The HIG is interested in electrical equipment of historical interest and its whereabouts; if possible information on its origin, year of manufacture, where it is being used or where it has been used with a short description of technical details. Moreover we should like to know whether it is in a safe place and if it could be donated for a future Engineering Museum. We are interested in old books, magazines and other documentation on electrical engineering. This includes stories, anecdotes and photographs from the early days of electrical engineering in South Africa as well as biographies of engineers and other personalities who played an important role in engineering achievements in this country."

Activities of the HIG during 1983 included paper presentations, visits to museums, publication of an SAIEE Historical Index 1909-1980, which incorporates presidential addresses, papers, synopses, and author index, and a 1984 calendar commemorating notable events in electrical engineering history in South Africa. For further information on the work of the HIG, contact P. Man in 't Veld, P.O. Box 61019, Marshalltown, 2107, South Africa.

Wheeler's Gift— A Legacy and a Responsibility

J. E. Bedi

One of the richest sources for research in electrical history is a priceless but neglected collection in the Engineering Societies Library at IEEE Headquarters. Known as the "Wheeler Gift," the collection consists of approximately 2,000 books, 3,500 pamphlets, and runs of 90 different periodicals, put together by J. Latimer Clark and given to the American Institute of Electrical Engineers in 1901. The story of this collection can serve as a barometer of engineers' changing regard for their history.

Josiah Latimer Clark was born in England in 1822. His first love was chemistry, but, with the growing activity in railway construction in the late 1840s, he decided to give up his position with a Dublin chemical firm and join the railroads as a surveyor. This put him in direct contact with the blossoming telegraph industry and his increasing interest in and understanding of electricity landed him a position with the Electric Telegraph Co. From this point, his stature in the electrical community began to grow and he worked on such problems as maintaining service in submarine cables, insulating electric lines, and standardizing electrical units.



Josiah Latimer Clark

Clark was also an ardent bibliophile throughout his long life. In 1897, he wrote,

I have been collecting everything I can find in all languages for forty-seven years. In that long time (during which I kept a skilled librarian) I succeeded in getting all English books both old and new. I also got a very large quantity of all foreign works, especially the rarer and older ones. In the line of pamphlets connected with early telegraphy my collection is quite unique, and comprehends 125 volumes. Although I still search catalogues, I rarely find anything that I have not got.

Telegraphic Journal and Electrical Review, vol. 4, 1876

The collection which Latimer Clark put together dates back to the 15th century and includes such priceless volumes as a folio edition of the *Speculum Naturale* of Vincent of Beauvais, printed in 1473; Sacro Bosco's (John of Holywood) *De Sphera Mundi*, 1478, with commentary by Galileo; a black letter folio of Albertus Magnus *De Anima*, 1494; and Pliny's *Naturae Historiarum*, 1497, with translation. The collection is also particularly rich in tracts and treatises dealing with magnetism. These range from the *Epistola de Magnete* of Petrus Peregrinus, a landmark in magnetic philosophy, which was written in 1269 and printed at Augsburg in 1558, to pieces on the legendary history of the magnet—including a discussion of the "flesh" magnet which could supposedly adhere to skin and had the capability "even of drawing the heart out of a man." Seminal works in the development of electric motors, the mathematical theory of electrical current, and the evolution of both land and submarine telegraphy are also represented. The *Proceedings of the Institution of Electrical Engineers* reported in 1899 that Clark's collection

... so far as electrical works are concerned, is unequalled. There are few, if any, works of importance missing. All are preserved and bound with the lover's conception of appropriateness and permanence...

Latimer Clark had always planned that his collection would take up permanent residence in the United States, since Great Britain already had a similarly complete collection in the Library of Sir Francis Ronalds. In lieu of an American buyer, the collection was to go to Japan. Clark died on 30 October 1898, and, by early 1901, the collection was officially on the market.

The American Institute of Electrical Engineers began negotiations with Andrew Carnegie for the purchase of this valuable collection of electrical books, pamphlets, autographs, and portraits. Before Carnegie made a decision, however, Schuyler Skaats Wheeler bought the collection and told the Institute that he intended to make a gift of it to the AIEE. Carnegie, in the meantime, agreed to purchase the collection, and, when informed that this was already accomplished, countered by donating the purchase price—\$6,880.28—to a fund for housing, cataloguing, and completing the collection.

At the annual meeting of the AIEE on 21 May 1901, Wheeler presented the Clark collection to the Institute. In the Deed of Gift, he states,



Schuyler Skaats Wheeler

My object in securing the collection was to present the books to our Institute and make it the custodian of the most complete electrical Library in the world... I have always been a strong believer in the principle that every professional man is under obligation to contribute in some way to the welfare of the profession in which he is engaged, and in obedience to this idea I now desire to present this Library to you...

The gift carried with it five conditions; that the Library be kept insured against fire, that a complete catalogue of the collection be compiled immediately, that the Library be controlled by a Committee of representative members of the AIEE, that the Library remain in New York City as a reference library open to all, and that rare books be exhibited at and preserved by the Library.

After Wheeler donated the collection, he continued to make additions to it, and the historical books already held by the AIEE library were added to the Clark collection as well. Brother Potamian (Dr. M. F. O'Reilly, Professor of Physics, Manhattan College, New York City) was chosen to catalogue this combined historical material, with assistance and advice from the Library of Congress, the British Museum, the Bodleian Library of Oxford University, the Institution of Electrical Engineers, the Concilium Bibliographicum of Zurich, and many others. Copies of the resulting two-volume, annotated catalogue were sent to each member of the AIEE, as stipulated by Wheeler in the Deed of Gift.

In 1913, the Engineering Societies Library was formed, uniting the collections of the AIEE with those of other national engineering societies. In the process of cataloguing this combined library, the Clark collection was disassembled. As the years progressed, Wheeler's priceless gift, so valued in its own time, slipped into obscurity. With the momentum that the study of electrical history has gained in the last few years, however, scholarly interest in the collection should be renewed. It is to be hoped that, in the near future, engineers and historians will devote increased and deserved attention to "the most complete electrical Library in the world."

IEEE Center for the History of Electrical Engineering

The Institute of Electrical and Electronics Engineers

IEEE History Committee—1984

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BRIEFS

AT&T Archives

The AT&T archives contain a rich collection of material for the years 1876-1930 relating to the Company's organization, financing, operations, commercial growth and technological development. The collection includes more than 500 volumes of letterpress books of general manager and president's correspondence and over 500 boxes of general correspondence, reports and business memoranda catalogued by subject. Material of more recent vintage is less complete and is now being assembled and catalogued.

To encourage utilization of the archives, AT&T established a Fellowship in Telephone History in 1984 in support of doctoral research into the history of the AT&T Company, its predecessor and associated enterprises. Applications for this year's Fellowship closed on 1 March; the recipient will be announced by 15 April.

IEEE Portland Section

John Senior, Director of the Bakken Library of Electricity in Life, was the guest speaker at a dinner last November sponsored by the Portland section of the IEEE for electrical engineering students currently enrolled at the University of Portland and Oregon. Entitled, "Electricity: Pure Physick of the Skies," Senior's illustrated presentation dealt with the non-traditional uses of electricity from antiquity to the early 20th century.

Bakken Library

Recent acquisitions at the Bakken Library of Electricity in Life in Minneapolis include *Ars magnesia...*, 1631, the first book by A. Kircher, in which he described magnetic experiments, games, paradoxes and a device for measuring magnetic power, as well as some applications of magnetism in medicine, navigation, astronomy, and mechanics; *The curious and accurate observations... of the cramp-fish*, by S. Lorenzini, 1705, the earliest English edition of the first book-length study of the torpedo, or electric ray; a 1910 Spanish trade catalogue, *Catalogo de optica, instrumentos de precision y electricidad*, full of illustrations and prices of such items as telescopes, lightning rods, microscopes, batteries, and telephones and their accessories; and *Le Verre Electrisé*, a chromolithograph, dating from c. 1885, which gives directions for a parlor game in which the powers of static electricity are harnessed to make a paper cross or arrow point at the person of one's choice.

Lewis Latimer Remembered

Lewis Howard Latimer, the son of an escaped slave, was born in Chelsea, Mass., in 1848. A skilled draftsman, Latimer worked with both Bell and Edison. An inventor in his own right as well, he held patents for an electric lamp, a method of manufacturing carbons for electric bulbs, a cooling and disinfecting device, and a water closet for railroad cars. He was also an author, both literary and technical, publishing *Poems of Love and Life* and *Incandescent Electric Lighting, A Practical Description of the Edison System*. The many facets of Latimer's long life were remembered at the Edison National Historic Site program held in Latimer's honor on 16 February. The featured speaker was Winifred Norman, Latimer's granddaughter.

Wanted: The 2-B Regrettor

Eric Weiss, an editor of the *Annals for the History of Computing*, is seeking the help of *Newsletter* readers in tracking down an elusive bit of history. He writes:

"An anonymous spoof description of an imaginary electronic device, the "2-B Regrettor," was written in 1937 by someone in the Bell System family of companies. It parodied the style of the Bell System Practices and was widely copied and distributed. It was reprinted in the 1942 hectographed MIT Radiation Laboratory "Radiator," in at least one of the later editions of Hershey's "Automatic Telephone Practice," and, most recently, in the *Journal of Irreproducible Results*. Its author was rumored to have been an employee of Western Electric's West Coast sound-on-film subsidiary, EPRI, although other rumors place the author with the Michigan Bell Telephone Company or the New England Telephone and Telegraph Company.

"The *Annals of the History of Computing* is considering reprinting the paper with some commentary because it shows the temper of the times and the nature of precomputer electronic thinking. Because the publication was informal and unauthorized, it has not been preserved or indexed in the existing Bell System archives. I would appreciate correspondence from anyone having more information on the "2-B Regrettor" or an original copy of its description. I would particularly like to be able to identify the author."

Eric Weiss may be contacted at Box 222, Springfield, PA, 19064.

The Newfoundland Story

The Center has recently received a copy of "The Newfoundland Story" from Wallace Read, Director of IEEE Region 7. Compiled in 1975 by David Templeton, General Manager, Newfoundland Light & Power Co. Ltd., and Read, Senior Vice President, Newfoundland and Labrador Hydro, "The Newfoundland Story" discusses the establishment and growth of the electrical power system in Newfoundland and Labrador, starting with the formation of the first electric utility company in 1885. A limited number of copies of "The Newfoundland Story" are available from C. W. Bursey, Public Relations Officer, Newfoundland and Labrador Hydro, P.O. Box 9100, St. John's, Newfoundland, Canada, A1A 2X8.

Landmark Disk File

On 27 February, the American Society of Mechanical Engineers designated the computer industry's first random access magnetic disk file, the IBM 350 RAMAC, an engineering landmark. Before disk files, searches for necessary data had to be made through miles of magnetic tape or stacks of punched cards. The first RAMAC (Random Access Method for Accounting and Control), changed that. It consisted of a stack of 50 24-inch magnetic disks which revolved at 1,200 revolutions per minute and were directly accessible to the computer through electromagnetic heads that darted between the disk to retrieve and record data. The file contained a total of five million characters of information. In ceremonies in San Jose, Calif., ASME president Frank Scott presented the commemorative plaque to Dr. John Bertram, IBM vice president and president of the General Products Division.

Canadian Centennial Celebrations

The Newfoundland and Labrador Section, IEEE Region 7, has initiated a program to publicize the IEEE and its centennial locally through the use of the Center's poster exhibit, "A Century of Electricals." Aimed at professionals and students in electrical and related fields, the section is displaying the posters in a convenient location in the administrative offices of the electric power and communications utilities and in the university and colleges. The posters are circulated, one each week, to each location.

NEW PUBLICATIONS

The Newsletter's "Publications" section was prepared by Ronald R. Kline of the University of Wisconsin-Madison and Robert Casey of the Center staff, with assistance from Thomas Higgins and John Neu, also of the University of Wisconsin.

Books

Christopher Evans. *The Making of the Micro - A History of the Computer*. Oxford: Oxford University Press, 1983. 114 pages.

This is a popular overview of the development of digital computers. The author begins with the work of John Napier and covers the efforts of Blaise Pascal, Gottfried Leibniz and Charles Babbage to devise mechanical aids to calculation. Evans links these early figures to the twentieth century works of Shannon, Bush, Stibitz, Wiener, Mauchly, and Aiken. He also stresses the importance of the cryptographic work done at Bletchley Park during World War II. The book closes with a discussion of transistors and integrated circuits and their effects on the design of computers. Christopher Evans, who died in 1979, was a psychologist and computer scientist, and author of *The Mighty Micro*.

John D. Ryder and Donald G. Fink. *Engineers & Electrons*. New York: IEEE Press, 1984. 251 pages, illustrated.

This is a popular history of the development of electrical engineering, as told by two of the profession's most eminent practitioners. The authors begin their account with the work of such 18th century figures as Franklin, Coulomb, and Galvani, and carry the story chronologically through to the present day. Of particular interest is the discussion of the merger between the AIEE and IRE to form the IEEE. Both Fink and Ryder were intimately involved in the merger arrangements and bring a personal insight to this phase of IEEE history. John D. Ryder, a distinguished engineer and engineering educator, served as president of the IRE, was the first Editor of the IEEE, and is presently chairman of the Task Force for the 1984 IEEE Centennial. Donald G. Fink was Editor of *Electronics* magazine and was Director of Research for Philco Corporation. He also served as President of the IRE and was the first General Manager of the IEEE.

Dorothy Varian. *The Inventor and the Pilot*. Palo Alto, CA: Pacific Books, 1983. 314 pages, illustrated.

This is a biography of Russell and Sigurd Varian, the inventors of the klystron microwave tube and founders of Varian Associates. This first half of the book recounts the early personal lives of the Varian brothers—Russell's education at Stanford and his numerous jobs (including a stint working on television with Philo Farnsworth), and Sigurd's career as a pilot and skilled mechanic. The second half of the book focuses on the brothers' collaboration on the development of the klystron—their early struggle to obtain funding from Stanford, the production of a workable klystron, and the involvement of

Sperry Gyroscope Company. After World War II the brothers formed Varian Associates, which continued the development and manufacture of klystrons, and expanded into the production of scientific instruments. Dorothy Varian, Russell's widow, worked in advertising and was treasurer of Varian Associates in its early years.

R. M. Black. *A History of Electric Wires and Cables*. Stevenage, U.K./New York: Peter Peregrinus Ltd., 1983. IEEE History of Technology Series No. 4. 204 pages.

An account of the development of the principle types of electric wires and cables, from the earliest times through the 1950s. It begins with the initial experiments in electrostatic telegraphy and discusses such varied topics as transatlantic cables and the ionization problems that beset high voltage cables in the thirties. Along the way, the reader encounters such luminaries as Faraday, Edison, Sebastian Ziani de Ferranti, Luigi Emanuelli, and P. V. Hunter. The final section of the book is a brief account of recent developments such as radiation processing, superconductivity, fully-filled telephone cables, optical fiber cables, and low fire risk cables. Dr. Black is a research chemist who is presently Information Officer of BICC Research and Engineering Ltd. He is the author of over forty scientific and technical papers.

Elizabeth Antebi. *The Electronic Epoch*. New York: Van Nostrand Reinhold, 1983. 256 pages, illustrated.

This book attempts a synthesis of the electronic epoch in both words and pictures. Organized into 26 short chapters and interspersed with 16 brief technical essays by experts, the text is matched with well-presented illustrations in a "coffee table" format. An extensive bibliography is included as well. Elizabeth Antebi is the author of several books, an encyclopedia editor, an investigative reporter, and producer and journalist for the Research Division of the French Broadcasting Corporation.

Articles

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Society for Industrial Archaeology

The 13th annual conference of the SIA will be held in Boston on 14-17 June 1984. For much of the 19th century, Boston was a hub of American industry, but the present city little reflects that heritage. The problems and opportunities for interpretation inherent in an examination of Boston from an archaeological perspective will provide the focus for the meeting's tours and paper presentations. Details on the conference may be obtained from the Charles River Museum of Industry, 154 Moody Street, Waltham, MA, 02154 (617-893-5410).

Electro-Culture 1984

The annual meeting of the IEEE Society on Social Implications of Technology will be held this year in conjunction with the Society of Photo-Optical Instrumentation Engineers' Technical Symposium East '84. Session topics for Electro-Culture 1984 include robotics, automation, society and work; computer and communications privacy and security; government imposed secrecy and technology transfer; and weapons in space. The conference will be located at the Hyatt Regency Crystal City Hotel, Arlington, Virginia, from 1-2 May.

Institution of Electrical Engineers, UK

The Science, Education & Technology Division of the IEE will hold its annual History of Electrical Engineering Weekend on 6-8 July 1984. The papers planned for the weekend include ones on the history of radar, semi-conductors, and computer memories; the Midland Railway and AC traction; the phonograph as a waveform recorder; and amplified telephone lines before negative feedback. Also scheduled are trips to the Heysham Power Station and to the North West Waterboard Conjunctive Use Scheme. Anyone interested in taking part in the weekend may contact the IEE, P.O. Box 26, Hitchin, Herts, SG5 1SA, England.

The IEE will also host a lecture on "James Graves (1833-1911) First Superintendent of the Valentia Telegraph Station," by Dr. D. M. de Cogan, on 23 May 1984, and a colloquium, titled "Electrical Energy for Everyone," on 7 November 1984. Both events will take place at the IEE's Savoy Place, London, headquarters.

MEETINGS

Lowell Conference on Industrial History

The Lowell Conference on Industrial History will be held on June 7-8 at the University of Lowell in Lowell, Massachusetts. The theme of the conference is "The World of the Industrial Revolution: Comparative and International Aspects of Industrialization." Individual sessions will focus on power generation, machine technology, the industrial city, labor, and the economy. For further information, write the Lowell Conference on Industrial History, Lowell National Historical Park, 169 Merrimack Street, Lowell, MA, 01852.

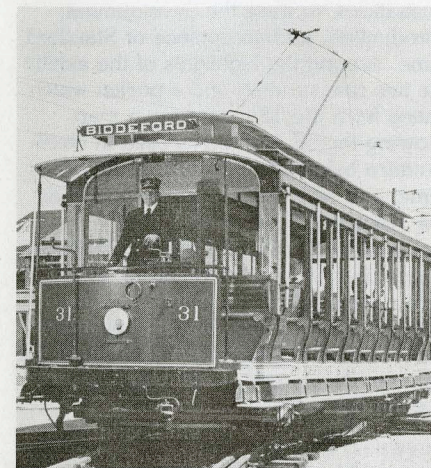
Computer History

The National Computer Conference will be held in Las Vegas, Nevada, on 9-12 July. Sponsored by the Association for Computing Machinery and the American Federation of Information Processing Societies, the conference will feature a Pioneer Day on July 11, celebrating Lawrence Livermore National Laboratory computers. For additional information, contact AFIPS, 1815 N. Lynn Street, Arlington, VA, 22209.

Seashore Trolley Museum

The Seashore Trolley Museum in Kennebunkport, Maine, was established in 1939 as the Seashore Electric Railway, and is the principal activity of the New England Electric Railway Historical Society. The museum's collection spans a century of mass transit, with a special focus on electric rail vehicles. Visitors to the museum have the opportunity not only to view over two dozen historic trolley cars, but to ride a restored electric trolley as well.

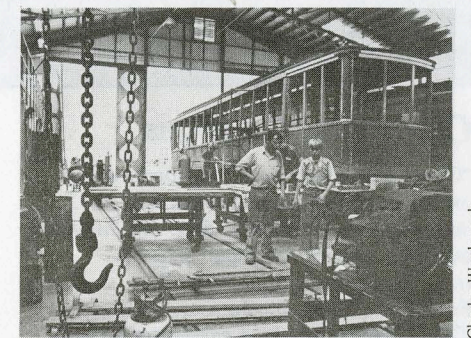
The museum's "railway shop" is also open to visitors. All maintenance, preservation, and restoration of the museum's collection is carried out by craftsmen in this shop. In addition, the shop provides educational opportunities for museum members who wish to learn these skills and then put them to use on the museum's trolleys.



Twelve-bench open summer car from the Biddeford and Saco Railroad (ME), built in 1900. This was the first car acquired by the museum, in 1939.

Henry Brainerd, Executive Vice-President of the museum and IEEE Life Member, points out that 1984 is the sesquicentennial of the first electric motor, which was built by Thomas Davenport at Brandon, Vermont, in 1834. Mr. Brainerd is available to give an illustrated talk on the history of electric traction and may be contacted through the museum.

The Seashore Trolley Museum is open from spring through fall. For further information, contact the Seashore Trolley Museum, P.O. Box 220, Kennebunkport, ME, 04046 (207-967-2712).



Car from Montreal undergoing major restoration—body, electrical, and mechanical.

Center Changes—Current and Pending

The staff of the Center for the History of Electrical Engineering is undergoing some changes. At the end of March, Robert Casey, the Center's Assistant Historian, left to assume the position of Director of Research and Education at the Sloss Furnaces National Historic Landmark in Birmingham, Alabama. Bob's new position promises to make good use of his many years of experience in the steel industry as well as his considerable talents as a historian.

The Center's Director, Robert Friedel, has announced his intention to leave the IEEE this summer. He will be accepting an appointment as Associate Professor of History at the University of Maryland, College Park. The IEEE History Committee has announced the formation of a Search Committee to assist in finding a new Director for the Center. The Search Committee chairman is Dr. Bernard S. Finn, Curator of Electricity at the Smithsonian's National Museum of

American History. Dr. Finn has asked that the following advertisement be placed in this issue of the Newsletter:

The Institute of Electrical and Electronics Engineers is seeking a Director for its Center for the History of Electrical Engineering in New York City. The Center, now in its fourth year, has the mission of promoting the study of the history of electrical science and technology. Candidates should have a Ph.D. in the history of science and technology, or its equivalent, and an ability to promote and manage the activities of the Center. Salary is commensurate with qualifications. The IEEE, a not-for-profit professional organization, is an equal opportunity employer. Inquiries and supporting material should be addressed to the Chairman of the Search Committee: Dr. Bernard S. Finn, Division of Electricity, National Museum of American History, Smithsonian Institution, Washington, DC, 20560 (202-357-1840)

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 _____

Zip/Postal Code _____

IEEE grade (if applicable) A M SM LM LS F LF _____

IEEE Membership No. (if applicable) _____

EXHIBITIONS AND MUSEUMS

Chips and Changes

"Chips and Changes," a major traveling exhibit about microelectronics and its increasing importance in daily life, began a two-year tour of American science museums with its opening at San Francisco's Exploratorium on 14 March. The 3,000-square-foot exhibition surveys the subject of technology and social change, explains how chips are manufactured and how software makes them perform various functions, and explores the field of artificial intelligence.

Much of the exhibition is devoted to applications of microelectronic technology

in the home, school, office, and workplace. Working computers, live demonstrations, models, and computerized polls, together with graphics and text, help the visitor to consider how this new technology is changing daily life and how its challenges may be met. "Chips and Changes" was organized by the Association of Science-Technology Centers and will be at the Exploratorium (3601 Lyon St., San Francisco, CA, 94123, 415-563-7337) until May 10. For further information on the circulation of this exhibit, contact ASTC Traveling Exhibition Service, 1413 K Street, NW, Washington, DC, 20005 (202-371-1171).

Standard Time

On 18 November 1883, the United States and Canada adopted a system of Standard Time which replaced the patchwork of locally-determined times across the continent. The impetus for this change came from the railroads and telegraph companies which were rapidly linking once-isolated communities and, in so doing, were also realizing the need for synchronized time. Standard Railroad Time, as it was called, divided North America into five time zones (Intecolonial, Eastern, Central, Mountain, and Pacific), each of which had a uniform time within its boundaries. This system, in modified form, still operates today.

To commemorate the centennial of the system, "Inventing Standard Time" opened at the National Museum of American History, Smithsonian Institution, on 18 November 1983. The exhibit offers 67 objects and documents, as well as 27 illustrations, to trace the development, introduction, and acceptance of Standard Time. Among the highlights of the exhibit are two rare sundials and a pocket watch dating from the 18th century, a map showing the 53 local times used in North America before the adoption of Standard Time, and such transportation guides as the *Traveler's Official Guide* and *Appleton's Railway and Steam Navigation Guide*. In addition, examples of 19th-century telegraph equipment used to transmit and distribute time signals are featured, making clear the dependence of time standardization on the telegraph system.

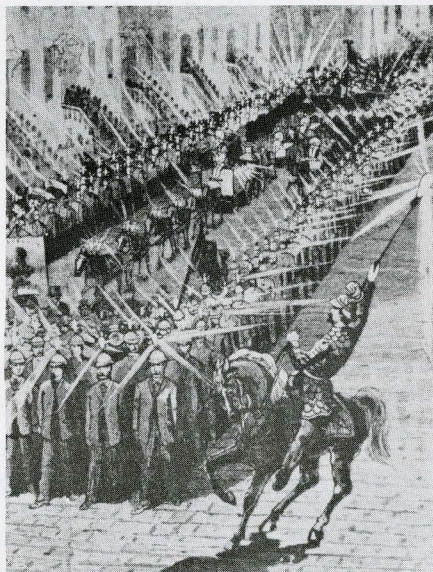
"Inventing Standard Time" will be at the National Museum of American History until May 21. The museum is located at 14th Street and Constitution Avenue, NW, Washington, DC, and is open daily from 10 am to 5:30 pm.

Centennial Slide Show

In conjunction with the centennial poster exhibit, "A Century of Electrics," the Center has produced a slide-tape presentation, under the sponsorship of the Centennial Task Force. The show explores the development of the electrical engineering profession, focusing on the lives and experiences of individuals, on the nature of their work and accomplishments, and on the social, technical and professional environment in which they made their contributions.

The presentation of 140 slides is accompanied by a taped narration, which lasts 33 minutes. Cassettes with either inaudible sync pulses or audible slide change cues are available, and a script is also provided for those wishing to give a live presentation. Reservations for the show may be made through Mark Lucas, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ. 08854 (201-981-0060).

Scientific American



An electric torchlight parade in New York, 1884



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