

IEEE CENTER FOR THE HISTORY OF ELECTRICAL ENGINEERING

Newsletter

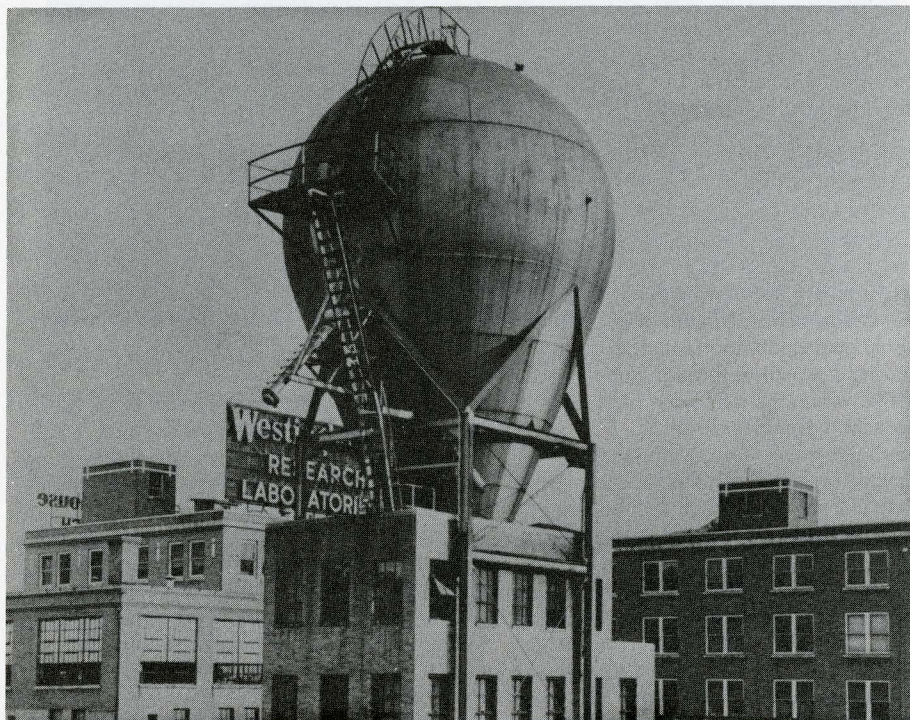
Number 9 Summer 1985

Westinghouse Atom Smasher Dedicated as Milestone

Nearly half a century after its construction in 1937, the *Westinghouse Atom Smasher* was dedicated as an IEEE Electrical Engineering Milestone in a ceremony held in Pittsburgh, Pennsylvania, on 29 May 1985. The *Atom Smasher* is the third Milestone to be designated in the IEEE's program of commemorating achievements of national and international significance in the history of electrical and electronics engineering.

The *Atom Smasher* was the centerpiece of the first large-scale program in nuclear physics established in industry. Westinghouse physicists designed the 5-million volt Van de Graaff generator, then the largest of its type in the world, to create nuclear reactions by bombarding target atoms with a beam of high-energy particles. The 5 million volts served as a voltage source to accelerate these particles down a vacuum tube extending from the top of the pear-shaped pressure vessel to a target 47 feet below. The steady voltage of the generator, its chief advantage over other types of accelerators, allowed the reactions to be measured precisely, thus contributing to basic knowledge of nuclear physics. Research with the *Atom Smasher* in 1940 led to the discovery of the photo-fission of uranium, part of the process involved in the generation of nuclear power.

A remarkable aspect of the *Atom Smasher's* history is that the Westinghouse Company made the decision to build the generator in 1936, three years before the discovery of nuclear fission opened up the possibilities of nuclear power. Internal records of the early years of the project indicate that company officials embarked on this ambitious program in pure research with the faith that practical applications would follow. The decision proved to be a sound one when, in 1947, Westinghouse formed the Department of Electronics and Nuclear Physics, headed by Dr. William E. Shoupp. One of the original Research Fellows assigned to the *Atom Smasher*, Shoupp went on to direct Westinghouse's pioneer work in the development of nuclear reactors for submarine propulsion (the USS *Nautilus*) and power generation (the first commercial plant at Shippingport, PA). The *Atom Smasher* continued in operation until 1958, when it was replaced by a more modern Van de Graaff generator, which is still in use.



Westinghouse

The Westinghouse "Atom Smasher", 1937

Speakers at the dedication ceremony were M. Dennis Taylor, Chairman of the IEEE Pittsburgh Section; Dr. Ronald R. Kline, Director of the IEEE Center for the History of Electrical Engineering; Professor Joseph F. Douglas, Director of IEEE Region 2; and James S. Moore, Vice President and General Manager, Westinghouse Water Reactor Divisions. Two bronze plaques, provided by the Pittsburgh Section, were placed at the site—one at a Company gate leading to the *Atom Smasher* building and one on the building itself. The Westinghouse Company prepared a permanent historical exhibit to commemorate the event, and the Pittsburgh Section devoted its annual History Meeting to the *Atom Smasher*.

Sections and Societies interested in nominating an Electrical Engineering Milestone should contact the Center for the History of Electrical Engineering.

Westinghouse R&D Archives

The importance of locating, publicizing, and preserving archives relating to the history of electrical engineering—a major emphasis of

the Milestone program—was clearly evident in the case of the *Atom Smasher*. Over the past few years, Dr. John W. Coltman, former Associate Director of the Westinghouse Research Laboratories, has organized and catalogued the Westinghouse R&D Center Library Historical File, which he used to great advantage in preparing the Milestone nomination for the *Atom Smasher*. Maintained by the R&D Library, the File contains books, serial publications, brochures, newsletters, publicity releases, organization charts, biographical files, correspondence, and reports. In addition to the comprehensive records of the early history of the *Atom Smasher*, the collection includes unpublished histories of the R&D Center and the complete letter file of John A. Hutcheson, Associate Director and Director of the Westinghouse Research Laboratories from 1944 to 1962.

For more information on the collection, contact Anita Newell, Librarian, Westinghouse R&D Center, 1310 Beulah Road, Pittsburgh, PA 15235 (412-256-1615).

IEEE History Fellowship Awarded

The 1985-86 IEEE Fellowship in Electrical History has been awarded to Paul B. Israel, a Ph.D. candidate in History at Rutgers, The State University of New Jersey, and an Assistant Editor with the Thomas A. Edison Papers, Rutgers University.

Mr. Israel is working on a dissertation entitled "Industrial Research in the Age of Invention: Technological Innovation in the Telegraph Industry, 1866-1909." He states, "The importance of the telegraph industry and the central role that technology played in it makes the industry a good subject for a study of the nature and impact of invention and innovation. The principal focus of this study will be on the years from 1866, when both the laying of the transatlantic cable and Western Union's consolidation of its national monopoly presaged important changes in the industry's structure, through the mid-1890s, when the telephone began to emerge as the dominant form of telecommunications. To explore what impact the telegraph's new secondary position had, the study will extend through 1909, when American Telegraph and Telephone gained temporary control of Western Union."

Applications are currently being accepted for the 1986-87 IEEE Fellowship in Electrical History. Funded by a grant from the IEEE Life Member Fund, the Fellowship is for either one year of full-time graduate work in the history of electrical science and technology at a college or university of recognized standing or for the support of up to one year of post-doctoral work in the same field. For a pre-doctoral recipient, the Fellowship stipend is \$8,500, with an additional amount of up to \$2,000 to pay academic tuition and fees. The stipend is \$10,500 for a post-doctoral recipient.

The recipient is selected on the basis of a complete description of the proposed research, college transcripts, letters of recommendation, and additional information supplied on the application form. The award is conditional on acceptance of the candidate into an appropriate graduate program in history at a school of recognized standing. Students with undergraduate degrees in engineering as well as those having degrees in the sciences or humanities are invited to apply. The deadline for receipt of applications for the 1986-87 academic year is 1 February 1986. Application forms may be obtained from the Center for the History of Electrical Engineering.

IEEE Sections Organize Archives

East Tennessee Section

As part of its celebration of the IEEE centennial, the East Tennessee Section completed an ambitious project to gather, screen, and microfiche Section records that have survived from its founding in 1936. The project, undertaken at the suggestion of 1984-85 Section Chairman, J. Reece Roth, was performed by a Centennial Archiving Committee composed of members of the Section. The committee gathered four file drawers of material, winnowed this down to about 20% of its original bulk, and had it microfiched. The material saved includes reports, financial records, newsletters, meeting announcements, minutes, yearbooks, correspondence, and activities files. Copies of the microfiched records were made and distributed to 13 repositories, among which are the University of Tennessee Library, the Library of the Tennessee Valley Authority, the Library of the Oak Ridge National Laboratory, and the

IEEE Center for the History of Electrical Engineering.

For more information on the collection, contact Professor J. Reece Roth, Department of Electrical Engineering, University of Tennessee, Knoxville, TN 37996, or the IEEE Center for the History of Electrical Engineering.

Pittsburgh Section

The Pittsburgh Section also completed a Centennial archival project last year. In April, the Section deposited its records for the years 1968-1983 in the Archives for Industrial Society at the University of Pittsburgh. The 3-cubic-foot collection includes by-laws, minutes of committees, reports of officers and committees, charts, manuals, and activities files. Involved in the transfer of the records were Pittsburgh Section member Ralph W. Simmons and M. Dennis Taylor, Section Chairman. An index to the collection is available from the IEEE Center for the History of Electrical Engineering.

For more information on the collection, contact, Frank A. Zabrosky, Curator, Archives of Industrial Society, Hillman Library, University of Pittsburgh, Pittsburgh, PA 15260.

MEETINGS

Society for the History of Technology

The 27th Annual Meeting of the Society for the History of Technology will be held at Dearborn, Michigan, on 17-19 October. Contact Prof. Larry Lankton, Dept. of Social Science, Michigan Technological University, Houghton, MI 49931, for registration materials.

Lowell Conference on Industrial History

The sixth annual Lowell Conference on Industrial History will be held in Lowell, Massachusetts, 1-3 November 1985. Planned around the theme of "The Popular Perception of Industrial History," the Conference will focus on the media's presentation of urban, economic, social, and technological history and on the public's understanding of its industrial past. Some limited subsidies for travel and lodging for individuals without institutional affiliations or whose institutions cannot fund travel costs are available. For further information, contact Robert Weible, Lowell National Historic Park, 169 Merrimack Street, Lowell, MA 08152 (617-459-1027).

The Institute of Electrical and Electronics Engineers

IEEE History Committee—1985

Harold Chestnut, Chairman
Thomas J. Aprille, Jr.
James E. Brittain
Jan Carr
Nathan Cohn
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Center for the History of Electrical Engineering

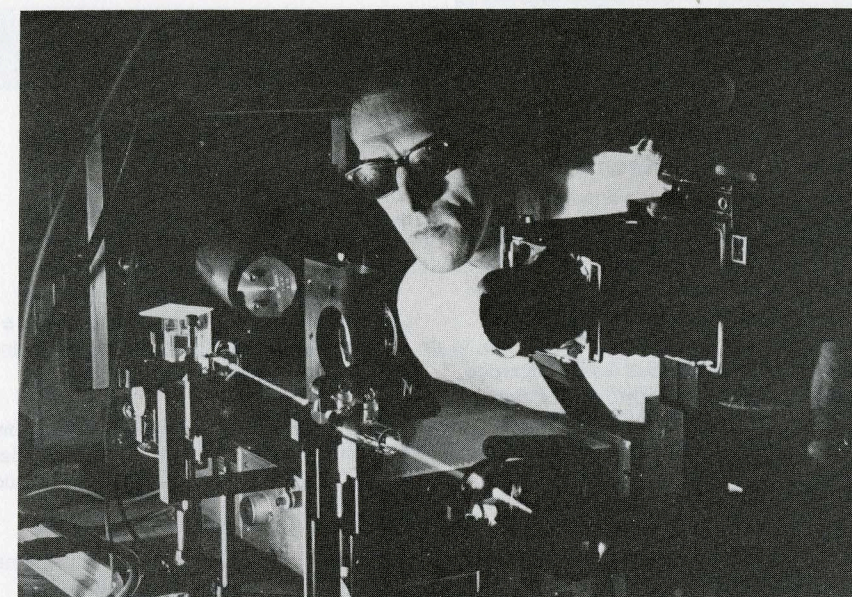
Ronald Kline, Director
Joyce E. Bedi, Curator
Anne C. Benson, Research Assistant
Address: 345 East 47th Street, New York, NY 10017
Telephone: (212) 705-7501

"The Laser at 25"

"The Laser at 25" is a new exhibition examining the quarter-century development of one of the most significant scientific inventions of our time. The exhibit is supported by a grant from the IEEE Lasers and Electro-Optics Society and the Optical Society of America, and was organized by the Smithsonian Institution Traveling Exhibition Service (SITES) and the Smithsonian's National Museum of American History.

In simple terms, the laser, an acronym for "light amplification by stimulated emission of radiation," is harnessed light—a concentrated beam of radiation in which all the rays have the same wavelength, are in phase, and are traveling in the same direction. The laser traces its roots back to Albert Einstein's 1917 prediction that, under proper conditions, light absorbed by atoms or molecules could stimulate them to emit radiation of the same wavelength, amplifying the original incoming light beam. Some thirty years later, Charles Townes, at Columbia University, used this idea in developing the maser ("microwave amplification by stimulated emission of radiation"), a device which used microwaves to stimulate the emission of short wavelength radiation from molecules.

In 1958, Townes and Arthur Schawlow, of Bell Labs, published a landmark article describing how the principle of the maser could be extended into the visible region of the spectrum, and explained how "optical masers," or lasers, could be built and expected to behave. The first operating laser



Laboratory apparatus used for measuring picosecond laser pulses

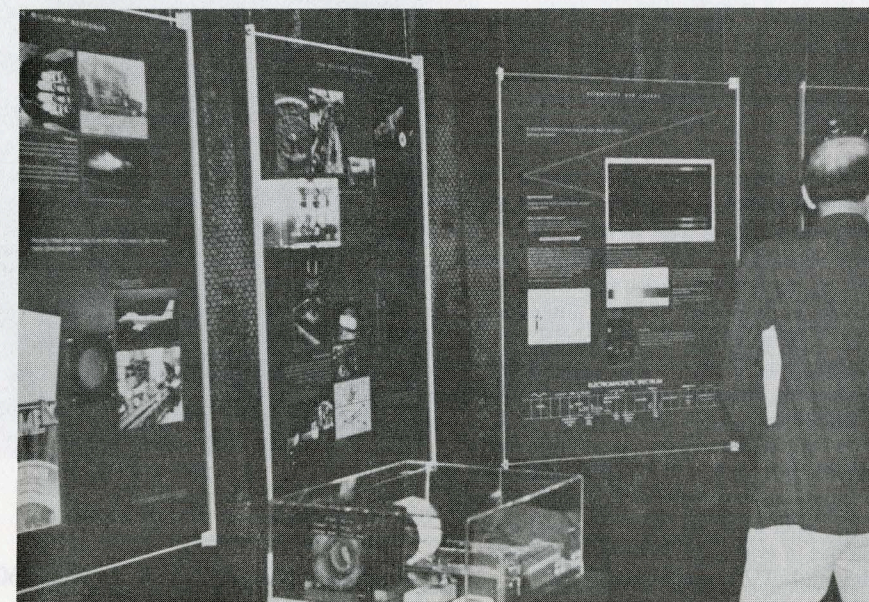
was demonstrated in 1960 by Theodore Maiman at Hughes Research Laboratories. He used a synthetic ruby crystal as the amplifying medium, but soon dozens of other lasers were developed, with crystals, liquids, gases, and semiconductors as the lasing material.

Today, the laser is an integral part of industry, communications, entertainment, manufacturing, defense, and medicine, but the historical development of the laser and the principles behind this device are not widely understood. "The Laser at 25" presents photographs, artifacts, graphic illustrations, text, and working models to tell

the stories of the people behind the invention of the laser, to illustrate the many uses to which it has been put, and to explain the basics of laser technology. Several interactive devices allow visitors to manipulate real lasers in theoretical and practical settings; one display demonstrates the ability of light to carry telephone conversations via fibers, while another allows visitors to check out their own "groceries" using a laser scanner. Holography (three-dimensional images produced with lasers) is also represented in the exhibition from both an industrial and an artistic perspective. With constant developments in laser technology and its various applications, "The Laser at 25" has been designed to incorporate the latest news in the field throughout its national tour. Exhibitors are encouraged to update the information provided in the displays, making the exhibition a dynamic and accurate representation of this growing realm of scientific exploration.

"The Laser at 25" opened at the Conference on Lasers and Electro-Optics in Baltimore on 21 May and is now at the Reuben Fleet Space Theatre and Science Center, San Diego, California, through 31 August. The exhibit will travel to 15 US cities by 1988. The curators of the show are Bernard Finn, National Museum of American History; Robert Friedel, University of Maryland; Alan Morton, visiting curator, Science Museum, London; and Elliot Sivowitch, also of the Smithsonian.

For further information, contact Ron Geatz, Public Affairs Officer, or Betsy Hennings, Exhibition Coordinator, Smithsonian Institution Traveling Exhibition Service, Washington, DC 20560 (202-357-3168).



Conference participants at CLEO attended the opening of "The Laser at 25" in Baltimore

BRIEFS

Archives Used in Rewiring Job

In 1908, Henry Mercer began transforming a Bucks County, Pennsylvania, farmhouse into his seven-story mansion called Fonhill. The house, which now operates as a museum, recently underwent a complete rewiring job, after two years of meticulous research carried out by the Bucks County Historical Society. Work orders and receipts from the time of Fonhill's construction helped researchers to identify authentic materials and to remain faithful to Mercer's will which states, "It is my clear and earnest wish that this My House Fonhill shall not be altered or reconstructed or modernized or refitted or changed." New wiring, true to the original, now carries electricity through the house and lights the carbon filament incandescent lamps.

Fonhill is located on Court Street in Doylestown, Pennsylvania, and is open to the public seven days a week, from 10 am-5 pm, by guided tour only. It is a good idea to call ahead and reserve a spot on one of the tours. For more information, contact either the Fonhill Museum (214-348-9461) or the Bucks County Historical Society, Pine Street, Doylestown, PA 18901 (215-345-0210).

Transformer History

Dr. Andrew A. Halacsy, Professor Emeritus of Electrical Power Engineering at the University of Nevada, Reno, has recently deposited his research collection relating to the history of the transformer with the University of Nevada Library. The collection, comprising 2 linear feet and covering the years 1856-1984, consists of reprints, patents, and microfilm of material in English, French, German, and Hungarian pertaining to the invention and development of the transformer. Also included in the collection is a recently acquired copy of an engineering notebook of the Ganz Electric Company, Budapest, containing data for the production of the company's first seventy-five transformers from September 1884 to December 1885. Among the entries in the notebook is data for the construction of a transformer for Galileo Ferraris, who used the apparatus in his pioneering experiments on the induction motor in 1885. Dr. Halacsy has also deposited a copy of the notebook with the IEEE Center for the History of Electrical Engineering.

For more information on the collection, contact the Archivist, University of Nevada Library, Special Collections Department, Reno, NV 89507 (702-784-6538).

Bakken Library

The mission of the Bakken Library of Electricity in Life is

- to acquire, conserve, and organize printed and recorded material and physical instruments, objects, and artifacts documenting the history of electricity as a cultural force and as a tool and object for the study of life in health and disease, and
- to promote the scholarly and popular understanding of that history and idea through the presentation and utilization of its collections.

The Bakken hosts exhibits and educational and musical programs, and publishes a newsletter titled *Electric Quarterly*. For more information, contact the Bakken Library of Electricity in Life, 3537 Zenith Avenue South, Minneapolis, MN 55416 (612-927-6508).

The Electric Valley

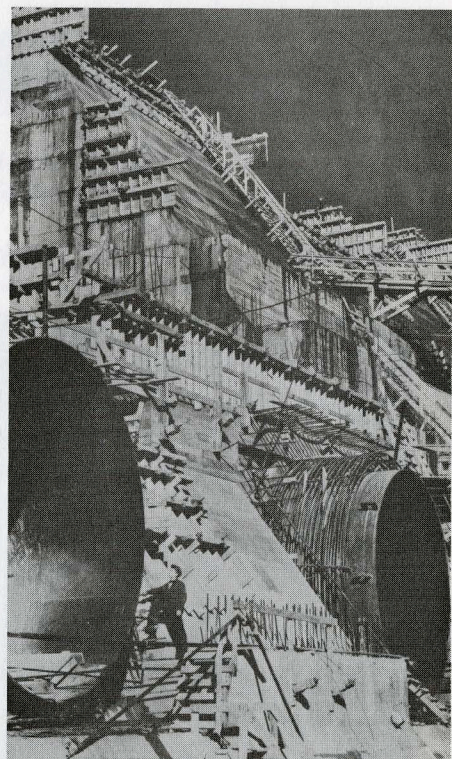
In 1933, the Tennessee Valley Authority was given the monumental task of creating a new prosperity in the Depression-racked Tennessee Valley, a region the size of Great Britain. Over the next 50 years, the TVA eliminated floods, produced cheap electricity, improved transportation, stopped erosion, built model towns, rebuilt the forests, wiped out malaria, electrified the dark countryside, invented bookmobiles, retrained workers, started new industries, and created a model for public-spirited, decentralized, non-political administration. In 1963, John Kennedy declared, "In the minds of men the world over, the initials TVA stand for Progress." But the TVA has had many enemies as well. It has been accused of being the nation's largest air polluter, of causing wholesale strip-mine destruction in Kentucky, of being antiunion, and of operating unsafe nuclear plants. This checkered history has been chronicled in *The Electric Valley*, a 90-minute color film produced by the James Agee Film Project. Directed by 1981 Academy Award nominee Ross Spears, *The Electric Valley* focuses on the people who made the TVA and on those who, for better or worse, were touched by it. The stories of engineers, editors, politicians, farmers, early TVA workers, authors, songwriters, and economists put a human face on one of the most remarkable institutions of our time.

Bell Canada Archives

Bell Canada maintains one of the oldest corporate historical collections in Canada. The collection of approximately 4,000,000 items includes documents, maps, books, drawings, artifacts, equipment, and audio-visual material that reflect the development of Bell Canada, its corporate affiliates, and the history of the telecommunications industry in Canada.

Particular strengths of the collection are the 80,000 photographs, slides, and advertisements, and the 3,000 sound and video recordings and motion pictures. The motion pictures, deposited at the National Film, Sound, and Television Archives in Ottawa, include very rare newsreel footage of Alexander Graham Bell circa 1915.

For further information, contact Stephanie Sykes, Assistant Director, Historical Services, Bell Canada, Room 820, 1050 Beaver Hall Hill, Montreal, Quebec, Canada H2Z 1S4 (514-870-7088).



Construction of Norris Dam, the first dam built by TVA

The Electric Valley may be rented for \$150. For details, contact the James Agee Film Project, 316 East Main Street, Johnson City, TN 37601 (615-926-8637).

NEW PUBLICATIONS

The Newsletter's "Publications" section was prepared with the assistance of Thomas J. Higgins of the University of Wisconsin.

Books

W.A. Atherton. *From Compass to Computer: A History of Electrical and Electronics Engineering*. San Francisco: San Francisco Press, 1984. 337 pp.

Compass to Computer is the latest in the genre of books covering the vast history of electrical and electronics engineering in one volume. The book is written to give engineers, technicians, and students a knowledge of their heritage and to provide engineering instructors material with which to present their subject from a historical viewpoint. Atherton begins his account with three chapters on the development of electrophysics from the Ancients to the formulation of quantum mechanics. Having given this background, of which the presentation of Maxwell's work and equations is remarkably lucid, he proceeds to the standard topics of telecommunications; electric lighting and power; and radio, TV, and electronics. After a chapter on the later history of electrophysics and information theory, Atherton returns to the technical story to present the development of semiconductors, integrated circuits, and the computer to the invention of the microprocessor. Based on many standard secondary sources and some primary material as well, *Compass to Computer* provides a very readable and broad account of electrotechnical history. Unlike many of its predecessors, the book treats most of these developments on an international basis by describing work done concurrently in Britain, the United States, and Europe.

Formerly a Lecturer in the Electrical Engineering Department at the University of Hong Kong, W.A. Atherton is now Engineering Training Projects Officer with the Independent Broadcasting Authority, England.

Stan Augarten. *Bit by Bit: An Illustrated History of Computers*. New York: Ticknor & Fields, 1984. 324 pp.

Despite its title, *Bit by Bit* is a solid, popular history of the computer based on standard secondary sources, not a coffee-table book. Augarten covers the history of the computer from the abacus to the personal computer in easily understandable terms. Yet he manages to describe the technology of these machines in some detail through the help of numerous illustrations and diagrams. The first part of the book is devoted to a wide variety of mechanical calculators (from those of Pascal in the 18th century to the differential analyzer of Vannevar Bush in the 1920s) and to numerous program-controlled, electromechanical calculators (those of Konrad Zuse, George Stibitz, and Howard Aiken in the 1930s and 40s). Augarten then covers the early history of electronic computers

through the work of such pioneers as Mauchly, Brainerd, Eckert, Atanasoff, Neumann, and Turing. The remaining chapters are devoted to the history of IBM, the Whirlwind Project at MIT, integrated circuits, and the personal computer. An appendix contains a summary of the FBI dossier on John W. Mauchly's security problems in the late 1940s.

Stan Augarten has been a reporter for the Associated Press and has covered Silicon Valley for newspapers and trade magazines.

George T. Mazuzan and J. Samuel Walker. *Controlling the Atom: The Beginnings of Nuclear Regulation, 1946-1962*. Berkeley: University of California Press, 1984. 530 pp.

Mazuzan and Walker, historians at the US Nuclear Regulatory Commission, have written a balanced history of the development of nuclear regulations by the Atomic Energy Commission. The book is not limited to the AEC, but also discusses the role of the congressional Joint Committee on Atomic Energy, other federal agencies, state governments, the nuclear industry, scientific and engineering societies, and labor unions in establishing these regulations. In addition to treating the political, legislative, and administrative aspects of their subject, the authors consider the technological and scientific concerns as well. A continuing theme throughout the book is how the AEC sought to balance its dual roles of promoting the nuclear power industry and regulating that same industry for the benefit of public health and safety.

As employees of the NRC, Mazuzan and Walker were permitted substantial intellectual freedom in writing their account, which they based on AEC records and other government archives and private papers. While chiefly written to provide the NRC a record of its history, the book informs a broader audience of the complicated political, social, and technological issues involved in the formative years of nuclear power regulation.

NEC Corporation. *The First 80 Years*. Tokyo: NEC Corporation, 1984. 120 pp.

This is a company history of the Nippon Electric Corporation, a large Japanese telecommunications and electronics firm, from its founding in 1899 to 1979. While the book covers the technological development of NEC's products, its focus is on the company's corporate philosophy, business management, and how major programs were formulated and implemented. *The First 80 Years* follows the history of the firm from its partnership with Western Electric at the turn of the century, through its association with the Sumitomo industrial combine, to its present status as a multi-national corporation. The company began in the telephone business, thereafter expanding into radio, TV, electronics, and computers. Particular emphasis is given to the management philosophies of the company's leaders, including the innovative style of Koji Kobayashi, the present Chairman of the Board and Chief Executive Officer.

Margaret Rowbottom and Charles Susskind. *Electricity and Medicine: History of Their Interaction*. San Francisco: San Francisco Press, 1984. 303 pp.

This book surveys the history of electricity and medicine from the practice of administering electrotherapy with sparks from Leyden jars in the mid-18th century to the introduction of CAT scanners in the mid-1970s. Originating from an exhibit prepared by Rowbottom for the Wellcome Historical Medical Museum in London in 1963, *Electricity and Medicine* describes the development of an enormously wide variety of electro-medical techniques and appliances in the context of their contributions to medical practice over the past two centuries. The history of electrotherapy, electrophysiology, early diathermy, and electricity in surgery is covered for the 18th and 19th centuries. Discussions of the measurement techniques of the EEG, ECG, and EMG, and the topics of X-rays, radioactivity, ultraviolet light, pacemakers, and computers in medicine fill the pages devoted to the 20th century. The book is well-documented and illustrated. A comprehensive name index provides references to biographical material on the more than 700 physicians, physicists, electricians, and engineers mentioned in the text.

Margaret Rowbottom was for many years curator at the Wellcome Medical Museum. Charles Susskind, an historian of electrical engineering, is on the engineering faculty of the University of California, Berkeley.

Other Recent Books

Asa Briggs. *The BBC: The First Fifty Years*. Oxford & New York: Oxford University Press, 1984.

Willem Hackmann. *Seek and Strike: Sonar, Anti-Submarine Warfare and the Royal Navy, 1914-54*. London: Her Majesty's Stationery Office, 1984. 487 pp.

T.A. Heppenheimer. *The Man-Made Sun: The Quest for Fusion Power*. Boston: Little, Brown and Co., 1984. 347 pp.

Alfred Price. *The History of U.S. Electronic Warfare: The Years of Innovation—Beginnings to 1946*. Vol. 1. Arlington, VA: Association of Old Crows, 1984. 312 pp.

Konrad Zuse. *Der Computer. Mein Lebenswerk*. Berlin: Springer-Verlag, 1984. 240 pp.

Articles

Aspray, William. "The Scientific Conceptualization of Information: A Survey," *Annals of the History of Computing*, 7 (1985), 117-140.

Auerbach, Issac L. "Eloge: Dov Chevion, 1917-1983," *Annals of the History of Computing*, 7 (1985), 4-6.

NEW PUBLICATIONS (cont.)

Broder, Albert. "La multinationalisation de l'industrie électrique Française, 1880-1931. Causes et pratiques d'une dépendance." *Annales; Economies, sociétés civilisations*, 39 (1984), 1020-1043.

Calvert, B.J. "Aircrew and Automation," *Journal of Navigation*, 38, No. 1 (Jan. 1985), 1-18.

Campbell-Kelly, Martin. "Christopher Strachey, 1916-1975, A Biographical Note," *Annals of the History of Computing*, 7 (1985), 19-42.

Coggeshall, Ivan S. "Oceanic Engineering: The Making of an IEEE Society," *IEEE Journal of Oceanic Engineering*, OE-10 (1985), 63-83.

Friedel, Robert. "New Light on Edison's Light," *American Heritage of Invention & Technology*, 1 (Summer 1985), 23-27.

Hadwiger, Don F. and Clay Cochran. "Rural Telephones in the United States," *Agricultural History*, 58 (1984), 221-238.

Harris, F.R. "The Parsons Centenary—A Hundred Years of Steam Turbines," *Proceedings of the Institution of Mechanical Engineers*, Part A, 198 (1984), 183-224.

Hildebrand, H.J. "100 Jahre Elektrizitätsversorgung," *Energietechnik*, 34 (1984) 361-364.

Johnson, Allen L. "Two Hundred Years of Airborne Communications," *Aerospace Historian*, 31 (1984), 185-193.

Jones, E.W.P. "Philip Vassar Hunter (1883-1956)," *Electronics and Power*, 31 (1985), 393-396.

Klauminzer, Gary K. "Twenty Years of Commercial Lasers—A Capsule History," *Laser Focus*, 20, No. 12 (Dec. 1984), 54-79.

Kukan, Adalbert. "Kuhnste Antennenkonstruktion: Europas feiert 50. Geburtstag," *Kultur & Technik*, 9 (1985), 30-33.

Mander, Mary S. "The Public Debate about (Radio) Broadcasting in the Twenties: An Interpretive History," *Journal of Broadcasting and Electronic Media*, 28 (1984), 167-185.

Marquis, Alice Goldfarb. "Written on the Wind: The Impact of Radio during the 1930s," *Journal of Contemporary History*, 19 (1984), 385-415.

McDowall, Duncan. "A Streetcar Few Desired: The Bermuda (Electric) Trolley Company, 1910-11," *Business History*, 27 (1985), 42-58.

"Minutes of 1947 Patent Conference (on ENIAC Computer), Moore School of Electrical Engineering, University of Pennsylvania," *Annals of the History of Computing*, 7 (1985), 100-116.

Nahin, Paul J. "Oliver Heaviside, Fractional Operators, and the Age of the Earth," *IEEE Transactions on Education*, E-28 (1985), 94-104.

Nakagawa, Yasuo. "The Development of Early Practical Electromagnetic Telegraphs and the Mechanization of Skilled Operation," *Historia Scientiarum*, 27 (1984), 77-89.

Nye, David E. "Public Relations as Covert Political Communication: The Debate over Public vs. Private Utilities in the United States," *American Studies in Scandinavia*, 16, No. 1 (1984), 21-35.

Osietki, Maria. "Die Grundung des Deutschen Museums: Motive und Kontroversen," *Kultur & Technik*, 8 (1984), 1-8.

Parkinson, D.H. "Some Thoughts on Trends in British Defence R and D," *Physics Bulletin*, 35 (1984), 308-309.

Paul, Richard P. "The Early Stages of Robotics," *IEEE Control Systems Magazine*, 5, No. 1 (Feb. 1985), 27-31.

Perry, Tekla S. and Paul Wallich. "Design Case History: The Commodore 64," *IEEE Spectrum*, 22, No. 3 (March 1985), 48-58.

Putley, E.H. "The History of the RSRE (Royal Signals and Radar Establishment)," *Physics in Technology*, 16 (1985), 5-11.

Scaife, W. Garrett. "The Parsons Steam Turbine," *Scientific American*, 252, No. 4 (April 1985), 132-137, 139.

Seidel, Rita. "Von der elektrischen Telegraphie zur Elektrotechnik. Zur Genese einer wissenschaftlichen Disziplin. Hannover als Beispiel," *Zeitschrift der Universität Hannover*, 11, No. 1 (1984), 39-47.

Sherry, A. "The Power Game—The Development of Conventional (Electric) Power Stations, 1948-1983," *Proceedings of the Institution of Mechanical Engineers*, Part A, 198 (1984), 257-280.

Tomayko, James E. "NASA's Manned Spacecraft Computers," *Annals of the History of Computing*, 7 (1985), 7-18.

Weiss, Eric A. "The Number 2-B Regrettor," *Annals of the History of Computing*, 7 (1985), 167-176.

Whitehead, John S. "Hydropower in Juneau: Technology as a Guide to the Development of an Alaskan Community," *Pacific Northwest Quarterly*, 75 (April 1984), 62-69.

Wilkinson, James H. "(Interview on) The Birth of a Computer (Designed by Alan Turing)," *Byte*, 10, No. 2 (Feb. 1985), 177-194.

Wilson, John. "A Strategy of Expansion and Combination (in the British Electric Traction Industry)," *Business History*, 27 (1985), 26-41.

Special Issues

IEEE Transactions on Sonics and Ultrasonics, SU-31, No. 6 (November 1984). Centennial issue containing articles on the history of the IEEE Sonics and Ultrasonics Group (1953-1984) and its local chapters, publications, and symposia.

IEEE Grid, 38, No. 12 (Dec. 1984); 39, Nos. 1-2 (Jan.-Feb. 1985). Contains an article by Emmet G. Cameron on the history of electronics on the San Francisco Bay Peninsula.

IEEE Transactions on Antennas and Propagation, AP-33, No. 2 (February 1985). Centennial issue with papers on the history of diffraction theory, radio propagation, antennas, and the Antenna Laboratory at Ohio State University.

Unpublished Manuscripts

Coopersmith, Jonathan C. "The Electrification of Russia, 1880 to 1925," Ph.D. dissertation, Oxford University, 1985.

Kaplan, Bonnie. "Computers in Medicine, 1950-1980: The Relationship Between History and Policy," Ph.D. dissertation, University of Chicago, 1984.

Todd, Edmund N. "Technology and Interest Group Politics: Electrification of the Ruhr, 1886-1930," Ph.D. dissertation, University of Pennsylvania, 1984.

The following papers pertaining to electrotechnical history were given at the conference, "The Early Phase of Multinational Enterprise in Germany, France, and Italy," held at the European University Institute (EUI) in Florence, Italy, on 17-19 October 1984.

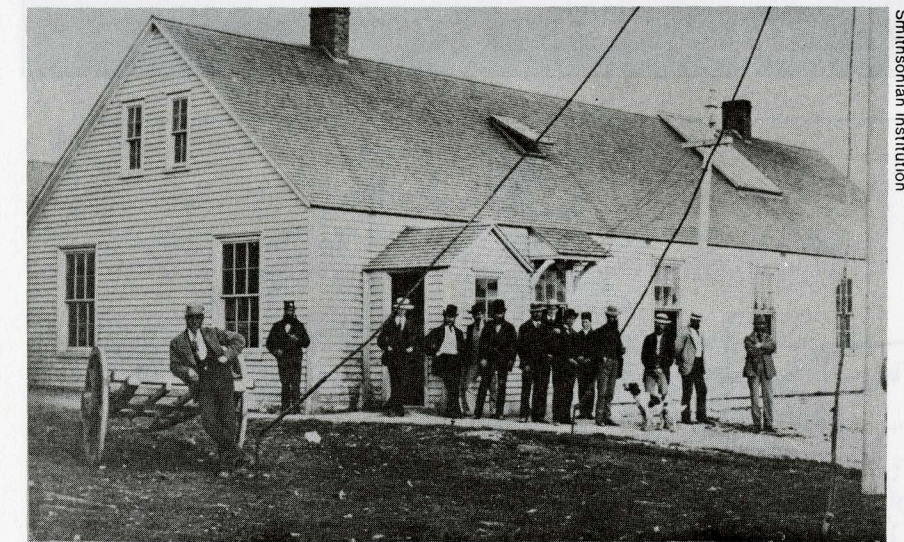
Gianetti, Renato (Universita degli Studi di Firenze). "The Conflict Between the Electricity Multinationals in the '20s and the Italian Case."

Hertner, Peter (EUI). "How They Changed Their Strategy: German Electrotechnical Industry in the Italian Market Before 1914 and Between the Two Wars."

Segreto, Luciano (EUI). "British Armaments and Electrotechnology Abroad: Vickers's Investments in Italy, 1905-1939."

Heart's Content Dedicated as Milestone

The landing of the first successful transatlantic cable in 1866 was commemorated as an IEEE Electrical Engineering Milestone in a dedication ceremony held at St. John's, Newfoundland, on 15 June 1985. Speakers at the ceremony were Byron Dawe, Chairman of the Newfoundland and Labrador Section; Wallace S. Read, Director of Region 7; Melvin Rowe, Section historian; and Merlin G. Smith, Executive Vice President of the IEEE. Assisting in unveiling the bronze plaque commemorating the Milestone were James Reid, Member of the House of Assembly, Baie de Verde; Fred Heath, Manager of Region 7; and Donald Blundon, Mayor of Heart's Content. A tour of the Heart's Content Cable Station followed the ceremony.



Cable station and staff at Heart's Content, 1872

Detweiler Electrical Centre

An unique educational experiment involving past and present electrical machinery will get underway this September at the Daniel B. Detweiler Electrical Skills Centre in Kitchener, Ontario. Located on the Doon campus of the Conestoga College of Applied Arts and Technology, a large Canadian community college, the Detweiler Centre was recently established to give students practical, "hands-on" experience with such electrical power machinery as motors, generators, and transformers. Construction of the Centre began in July 1984, funded by a grant from the Federal Government of Canada. Among the numerous laboratories are those devoted to ac and dc machines, a rewinding shop, and a control and systems lab.

The unique aspect of the Centre is the Electrical Machinery and Apparatus Hall. Housing old and new machinery donated by General Electric, Westinghouse, and other companies, the Hall resembles a small-scale electrical testing department. The juxtaposition of old and new machinery enables students to trace technological improvements and to see where, why, and how these changes have been made. For example, an old 66 2/3 Hertz 150 kW, 2-phase alternator without damper bars in the pole faces will demonstrate the undesirable phenomena of hunting and transients in a manner the students should not forget, especially when the machine is run alongside more modern alternators without these problems. The use of early equipment in this and similar ways will train

students to install, operate, test, maintain, and troubleshoot a wide variety of machinery and apparatus.

The experience provided by the teaching collection of machinery is further enhanced by the display throughout the Centre of over 200 photos of apparatus and personalities important in electrical engineering history. The Center for the History of Electrical Engineering's exhibit, "A Century of Electricals," is also on view.

For more information on the Centre, contact Heinz J. Peper, Manager, Electrical Skills Centre, Conestoga College of Applied Arts and Technology, 299 Doon Valley Drive, Kitchener, Ontario, Canada N2G 4M4 (519-653-2511).

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 sciences 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).

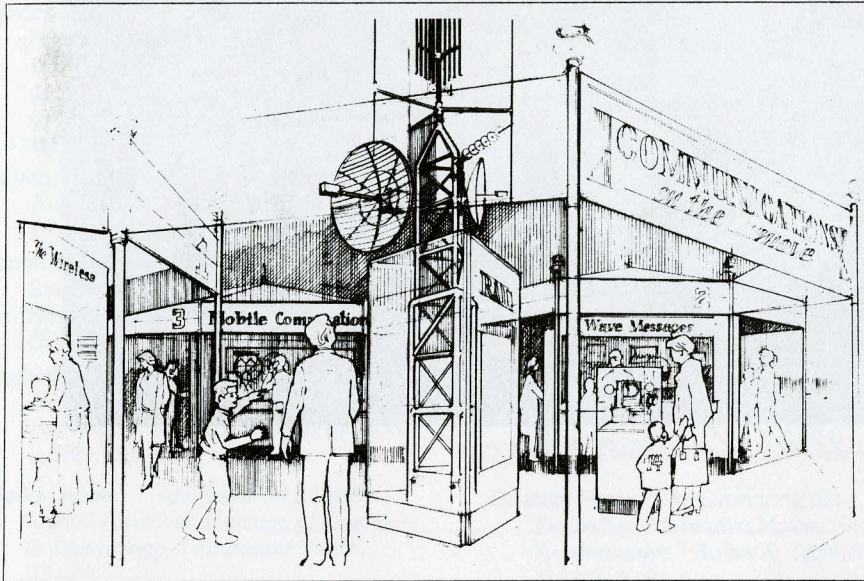
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EXHIBITIONS AND MUSEUMS



Artist's sketch of "Communications on the Move"

Communications on the Move

"Communications on the Move" is a new exhibit being developed by the Association of Science-Technology Centers with the Telocator Science and Education Foundation to place the mobile-communications industry in historical perspective. This exhibit will introduce the new technology of cellular telephones and radio paging devices and explore its likely social impact. Artifact displays, interactive devices, and graphics will explain the basic principles of sound transduction and transmission devices.

Visitors will have a chance to experiment with devices ranging in sophistication from a tin-can telephone to a pager the size of a ballpoint pen. Cellular communications equipment on the market today will also be displayed.

"Communications on the Move" is being designed by Newlin & Ikeda in cooperation with the New York Hall of Sciences. It is scheduled to open on 31 October at the Museum of Science and Industry in Chicago. For more information, contact the Association of Science-Technology Centers, 1413 K Street, NW, Washington, DC 20005 (202-371-1171).

MicroScapes

An exhibit exploring the aesthetic side of "high tech" has been produced by AT&T Technologies. "MicroScapes: The Hidden Art of High Technology" reveals the unseen images and colors of microelectronics and fiber optics materials in a selection of 47 scientific photographs from the Western Electric labs. The exhibit also includes displays of the technologies involved. For example, microscopes offer a view of microelectronic circuitry, and a synthesizer plays a Bach cantata stored on a chip.

"MicroScapes" will be at the Midland Center for the Arts, Midland, Michigan, from 13 July-25 August. For more information, contact the museum at 1801 West St. Andrews, Midland, MI 48640 (517-631-3250).

About ASTC

The Association of Science-Technology Centers (ASTC), which is circulating both "MicroScapes" and "Communications on the Move," is a not-for-profit organization of museums dedicated to furthering public understanding and appreciation of science and technology. ASTC seeks to improve the operation of science museums, to serve as a vehicle for cooperative projects among its members, and to advance the role of science museums in society.

Since its founding in 1973, ASTC has more than tripled its membership. It now represents 185 science, technology, health, and natural-history museums and related organizations throughout North America and on four other continents. For more information on ASTC, contact the Association at 1413 K Street, NW, Washington, DC 20005 (202-371-1171).



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