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. Shoup. One of the original Research Fellows assigned to the Atom Smasher, Shoup 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.

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. Colman, 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 R. 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 began to press on the industry's structure, through the mid-1890's, 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 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 post-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.

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 microfilm 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 folders of material, estimated to amount to about 20% of its original bulk, and had it microfilmed. The material saved includes reports, financial records, newsletters, meeting announcements, minutes, yearbooks, correspondence, and other files. Copies of the microfilmed records were made and distributed to 13 repositories, from 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, Frank A. Zaborsky, Curator, American Institute of Electrical History, Helm 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 1986. 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 Webbe, Lowell National Historic Park, 169 Merrimack Street, Lowell, MA 01852 (508-459-3077).

"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 exhibition 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 principles 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 was demonstrated in 1960 by Theodore Maiman at Hughes Research Laboratories. He used a synthetic ruby crystalline as the amplifying medium, but because of photons were developed, with crystals liquids, gases, and semiconductors as the lasering 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 inventors 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 fiber, while another allows visitors to check out their own "groceries" using a laser scanner. Holotrope (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 Theater 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 Stronge, Massachusetts Institute of Technology; and Elliot Swanson, also of the Smithsonian.

For further information, contact Ron Geatz, Public Affairs Officer, or Betty Herrington, Exhibits Coordinator, at the Smithsonian Institution Traveling Exhibition Service, Washington, DC 20560 (202-357-3168).
Balken Library

The mission of the Balken Library of Electricity in Life is

• to acquire, conserve, and organize original and recorded materials and physical, chemical, biological, and technical documentation of the development of electricity as a cultural force and as a tool and object for the study of life in health and disease,

• to promote the scholarly and popular understanding of that history through the presentation and utilization of its collections.

The Balken hosts exhibitions and educational programs, and publishes a newsletter titled Electric Quarters. For more information, contact Stephanie Sykes, Assistant Director, Historical Services, Balken Library, 3537 Zenith Avenue South, Minneapolis, MN 55416 (612-972-6500).

Bell Canada Archives

Bell Canada maintains one of the oldest corporate historical collections in Canada. The collection of approximately 6,000,000 items includes documents, maps, books, drawings, artifacts, equipment, and audiovisual material that reflect the development of Bell Canada, its corporate affiliates, and the evolution of the telecommunications industry in Canada.

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

For further information, contact Stephanie Sykes, Assistant Director, Historical Services, Bell Canada, Room 280, 1050 Beaver Hall Hill, Montreal, Quebec, Canada H2Z 1S4 (514-870-7088).

NEW PUBLICATIONS

The Newsletter’s “Publications” section was prepared with the assistance of Thomas J. Higgins of the University of Wisconsin.

Books


Compass to Computer is the latest in the series of biographies of leading figures in the computer and electronics engineering in one volume. The book is written to give engineers, technicians, and students a knowledge of their heritage and to provide a deeper understanding of their careers with which to present their subject from a historical viewpoint. Altherr begins his account with three chapters on the development of electromagnetics from the Ancients to the formulation of quantum mechanics. From this point, 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 electrical and information theory, Altherr 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 engaging account of electrical technology. Unlike many of the textbooks, the book treats most of these developments on an international basis by describing the events concurrently in Britain, the United States, and the Soviet Union.

For more information, contact Stan Augarten.

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Radio Transmitter History

Dr. Andrew A. Halsey, Professor Emeritus of Electrical Engineering at the University of Nevada, Reno, has recently deposited his research collection relating to the history of the transmitter with the University of Nevada Library. The collection, covering the early years of radio from 1901 to 1936, contains over 200,000 pages of correspondence, reprints, patents, and other written material in English, French, German, and Hungarian pertaining to the invention and development of the transmitter. Also included in the collection is a recently acquired copy of an engineering notebook of the Canadian inventor William N. C. Board, containing data for the production of the company’s first seventy-five transmitters from September 1894 to December 1885. Among the entries in the notebook is data for the construction of a transformer for Galileo Ferranti, who used the apparatus in his pioneering experiments on the induction motor in 1885. Dr. Halsey has also donated a copy of the notebook to 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).

The Electric Valley

In 1933, the Tennessee Valley Authority was given the monumental task of creating a new property in the Depression-wrecked 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 modern towns, rebuilt the forests, wiped out malaria, electrified the remote countryside, invented the retrained worker, 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, it itself is a symbol of America’s speed and potential.” But the TVA has had many enemies as well. It has been accused of being behind the nation’s largest air polluter, of causing wholesale strip-mining 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 Spear, The Electric Valley focuses on the people who made the TVA and on those who, for better or worse, were produced. It tells 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.

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, 356 East Main Street, Johnson City, TN 37601 (413-706-8637).


This book surveys the history of electricity and medicine from the practice of electricity with sparks from Leyden jars in the mid-18th century to the introduction of CAT scanning and interventional radiology to the world. The preliminary chapter exhibits prepared by Rowbottom for the Wellcome Historical Medical Museum in London in 1963; Electricity and Medicine describes the development of an enormous variety of electrical and electronic applications to medicine. The text also discusses the use of electric current in medicine, including the history of electrolysis, electrotherapy, electrodiagnosis, and other medical specialties, and the period surrounding the 18th and 19th centuries. Discussions of the measurement techniques of the EEG, ECG, and EMG, and the topics of X-rays, radiology, ultrasonic light, and computer-aided medicine also contribute to the richness of this text. The book is well-documented and illustrated. A comprehensive appendix provides references to historical material on the role of electricity, medicine, physics, electronics, 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, was on the engineering faculty of the University of California, Berkeley.


NEW PUBLICATIONS (cont.)


Wilkinson, James H. "Interview on The Birth of a Computer (Designed by Allen Turing)," Byte, No. 2 (Feb. 1985), 177-190.


Special Issues


Unpublished Manuscripts


The following papers pertaining to electrical engineering history were given at the conference, "The Early Multi-Purpose Enterprise in Germany, France, and Italy," held at the European University Institute (EIU) in Florence, Italy, on 17-19 October 1984.

Garretti, Renato (Universita degli Studi di Firenze). "The Conflict Between the Electricity Multi-Nationals in the '20s and the Italian Case."

Hettner, Peter (EIU). "How They Changed Their Strategy. German Electrical Industry in the Italian Market Before 1914 and Between the Two Wars.

Sagnoto, Luciano (ELB, British Armaments and Electrotechnology Abroad). "Vickes' Investments in Italy, 1905-1939."

Heart's Content Dedicated as Milestone

The naming 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 Dewer, Chairman of the Newfoundland and Labrador Section; Wallace S. Read, Director of Region 7, Malvin 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, Bea de Verde; Fred Heath, Manager of Region 7; and Donald Blandon, Member of Heart's Content. A tour of the Heart's Content Cable Station followed the ceremony.

Detwiler Electrical Centre

An unique educational experiment involving past and present electrical machinery will get underway this September at the Daniel B. Detwiler 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 Detwiler 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 recently received funds 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 test 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 motor 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 modern more efficient 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 personal important in electrical engineering history. The Centre for the History of Electrical Engineering's "A Century of Electrics," is also on view.

For more information on the Centre, contact Harold J. Pappas, Manager, Electrical Skills Centre, Conestoga College of Applied Arts and Technology, 299 Doon Valley Drive, Kitchener, Ontario, Canada N2C 4M4 (519) 663-2511.

The Newsletter of the IEEE Center for the History of Electrical Engineering is sent three times a year to a group of 250 interested electrical historians, others, 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).

Name
Address
Zip/Postal Code
IEEE Membership No. (if applicable)
EXHIBITIONS AND MUSEUMS

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).

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 transmission 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).