IEEE
Center for the History of Electrical Engineering

Newsletter No. 20 Spring 1989

1988 in Review

Through a variety of projects in 1988, the IEEE History Committee and the Center for the History of Electrical Engineering continued to promote the study and understanding of the history of electrical science and technology among engineers, historians, and the general public.

Awards. The History Committee and the IEEE Life Member Fund Committee co-sponsored two awards in 1988.

The *IEEE Life Members' Prize in Electrical History* is awarded annually for the best paper in electrical history published in a scholarly journal during the previous year. Ronald R. Kline, Cornell University, received the 1988 Prize for his paper, "Science and Engineering Theory in the Invention and Development of the Induction Motor" [*Technology and Culture* 28, no. 2 (April 1987): 283-313]. The Prize was established by the History Committee and is supported by the Life Member Fund and administered by the Society for the History of Technology.

The Life Member Fund Committee also continued its annual support of the *IEEE Fellowship in Electrical History*, which is administered by the History Committee and the Center. The Fellowship for the 1988-89 academic year was awarded to Michael Gunderloy, a Ph.D. candidate in the history of technology at Rensselaer Polytechnic Institute. Mr. Gunderloy is researching the history of computing at the National Bureau of Standards.

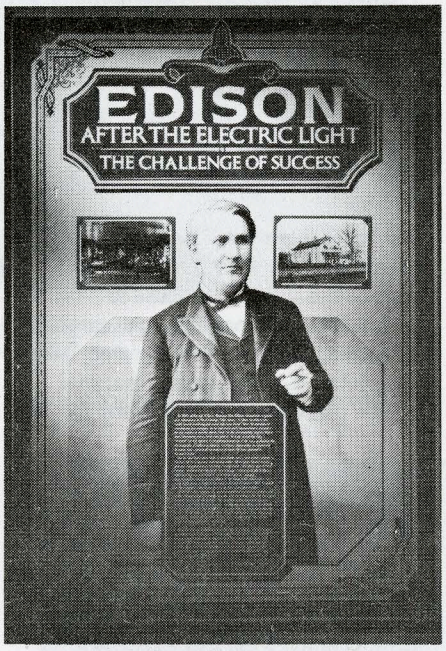
Electrical Engineering Milestones. The IEEE Electrical Engineering Milestones Program recognizes achievements of local, regional, national, and international significance in electrical engineering history. This program is administered by the Center and sponsored by the IEEE History Committee. One international and three national Milestones were added in 1988. These include

- Demonstration of practical telegraphy, Morristown, NJ, 1838 (see *Newsletter* No. 17)
- Ames Hydroelectric Generating Plant, Ames, CO, 1891 (see *Newsletter* No. 18)
- Commercial manufacture of transistors, Allentown, PA, 1951 (see page 7)
- Benjamin Franklin's work in London, 1757-1775 (to be dedicated in 1989)

Representatives from the IEEE, government, and industry participated in the public dedication ceremonies, which were covered by local press, the *IEEE Institute*, and the Center's *Newsletter*.

Exhibits. The Center's exhibits program continued to be an important part of the effort to increase awareness of the technical, social, and cultural heritage of electrical engineering. During 1988, "Edison after the Electric Light: The Challenge of Success" (see *Newsletter* No. 14) completed its two-year U.S. tour, traveling to science and technology museums in New York, North Carolina, Pennsylvania, and Indiana. The exhibit was co-curated by the Center and the Division of Electricity of the National Museum of American History, Smithsonian Institution.

Friends of the IEEE Center for the History of Electrical Engineering. The number of Friends doubled in 1988 and the geographical distribution of the Friends continued to expand. In 40



The Center/Smithsonian exhibit, "Edison after the Electric Light," traveled to 10 states during its two-year tour of U.S. museums.

U.S. states and 14 countries, more than 400 IEEE members and non-members alike showed their support for the Center's work by making their annual contribution to the Friends Fund of the IEEE Foundation. This funding is targeted for exhibits, publications, and other special projects above and beyond those made possible by the IEEE Life Member Fund.

Information Services. The Center serves as a clearinghouse for information on all aspects of electrical engineering history. The staff answered over 200 inquiries during 1988.

Joint History Committee/Life Member Fund Committee Projects. Three requests for funding of history projects

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were received by the Life Member Fund Committee and were referred to the History Committee for evaluation. Based on the History Committee's recommendations, the Life Member Fund supported

"Heinrich Hertz: The Beginning of Microwaves," an exhibit, organized by John Bryant of the Microwave Theory and Techniques Society, of replicas of Hertz's original equipment (see *Newsletter* No. 17). Dr. Bryant is also a member of the History Committee.

An archival and oral history project, coordinated by Prof. Thomas J. Misa of the Illinois Institute of Technology, to document the career of Marvin Camras. When completed, a guide to this material will be placed in the Center for the History of Electrical Engineering's research collections.

Completion of a bibliography on the history of television, edited by Christopher Sterling of George Washington University and Elliott Sivowitch, Division of Electricity, National Museum of American History, Smithsonian Institution. The bibliography was started by the late George Shiers, author of *Bibliography of the History of Electronics* (Metuchen, NJ: The Scarecrow Press, 1972).

The *Newsletter* reports on the activities of the Center and on new resources and projects in electrical history. It is published three times each year by the Center for the History of Electrical Engineering, Institute of Electrical and Electronics Engineers, 345 East 47th Street, New York, NY 10017 (212-705-7501).

The Newsletter *is made possible by a grant from the IEEE Foundation.*

Publications. The Center issued a special publication in 1988–*Recent Titles in Electrical History: A Selective Bibliography, 1982-1985*. The 54-page bibliography lists nearly 900 books, articles, and theses arranged by subject and indexed by author. In addition, the *Newsletter*, published three times each year, continued to report on the activities of the Center and on new resources and projects in electrical history.

Special Projects. Progress was made on a guide to oral history collections relating to electrical science and technology (see *Newsletter* No. 19). The guide is based on the results of a survey, conducted with support from the IEEE Life Member Fund, of 238 repositories in the U.S. Descriptions of more than 1,200 interviews were entered into a database and editing and verification of the information was begun. It is planned to publish the guide late in 1989.

The Center's participation in the Laser History Project continued as the Project came to a close late in 1988. The Center completed a survey mailing to companies and research institutions involved in the development of the laser concerning their archival holdings.

An international project jointly sponsored by the Center and the American Institute of Physics Center for History of Physics also concluded in 1988. The Center has received two reels of microfilm of a collection of the letters of Australian physicist Sir Richard Threlfall (see *Newsletter* No. 16). As the first professor of physics at the University of Sydney (1886-1898), Threlfall was involved in developing the first Australian courses in electrical engineering. He also served as a consultant to electrification projects in many Australian cities. The microfilming project was headed by Prof. R.W. Home, Dept. of History and Philosophy of Science, University of Melbourne.

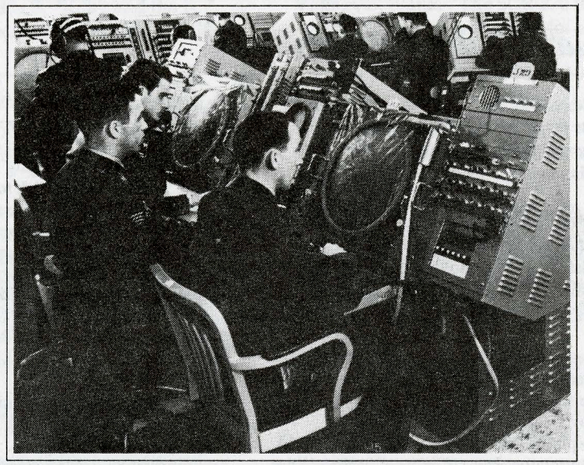
Staff Activities. Joyce E. Bedi, Acting Director of the Center for the History of Electrical Engineering, presented a paper on the Center's activities, focusing on the Electrical Engineering Milestones Program, at the Fourth National Conference on Engineering Heritage. Sponsored by the Institution of Engineers, Australia, the Conference was held in Sydney in December. Ms. Bedi also continued her involvement with the Society for the History of Technology (SHOT) and the American Institute for Conservation (AIC). Since 1987, she has chaired the Selection Committee for SHOT's Dibner Award for Excellence in Exhibits of the History of Technology and Culture and she has served as editor of *Artifactory*, the newsletter of SHOT's Technology Museums Special Interest Group, since 1984. During 1988, Ms. Bedi was named the AIC Photographic Materials Group representative to the planning committee for a joint AIC/Smithsonian traveling exhibit on conservation.

Craig Semsel, one of the Center's Research Assistants through the Northeastern University Cooperative Education Program, was accepted into the Undergraduate Honors Program at Northeastern. He is working on a study of Boston's elevated electric railroad.

Visitors. The Center welcomed 25 visitors and researchers from six countries during 1988. The archives and research collections are open by appointment to engineers, historians, students, and others engaged in historical research and publications. The Center's staff is also available for general consultation on historical projects.

System Development Foundation Records at Stanford

Roxanne Nilan
Curator, Stanford University Archives



MIT Museum

Computer systems developed by SDF processed information on air battles for visual display in the SAGE system.

The Stanford University Libraries has acquired the archival records of the System Development Foundation (SDF), a major institution in the history of computer and information science and sponsor of various research programs at Stanford University during the last decade. SDF, which ceased operations on 30 June 1988 has also provided the Libraries with funding for archival projects to make these resources accessible to scholars and for a twenty-year program which will create additional historical records in related areas of the history of computing. These collections enhance the Libraries' *Stanford in the Silicon Valley Project*, which has made Stanford a major repository for the intellectual and institutional history of science. Total SDF awards to the Libraries come to more than $130,000.

The System Development Foundation was originally founded as the System Development Corp. in 1956; it was a spin-off from the Rand Corp. SDC specialized in computer systems development, programming, and training related to aerospace and military programs such as the SAGE (Semi-Automatic Ground Environment) system. In 1969, the not-for-profit corporation was transformed into a profit-making enterprise and expanded its activities into commercial ventures such as information and database services. Burroughs Corp. purchased SDC in 1980, and the proceeds from the sale became the basis for the System Development Foundation, which, until its closing last year, was a leading grant-awarding institution in computer science.

Stanford has been one of the principal beneficiaries of SDF grants, receiving substantial funding for the Center for the Study of Language and Information (CSLI) and the Center for Computer Research in Music and Acoustics (CCRMA), as well as other smaller grants. SDF has also funded important programs at the University of California, California Institute of Technology, Massachusetts Institute of Technology, and Rand Corp. By concentrating its grants in fields such as computational linguistics, computer music, and robotics, the Foundation has made a significant impact on current directions in research.

The records given to Stanford document not only the workings of the Foundation, but also the institutional and intellectual development of computer science since the founding of SDC in the mid-fifties. The collection includes administrative records, annual reports, board minutes, financial information, grant files, and extensive subject files. Projects funded by SDF were followed closely by the Foundation, and these files document the evolution and results of research carried out at many institutions.

Two grants awarded to the Libraries by SDF will make it possible to process, catalogue, conserve, and enhance the collection. The first grant provides for archival processing, indexing, and physical conservation; it will result in the preparation of a guide to the collection for use by scholars. Information about the collection will also be added to the database of the Research Libraries Information Network (RLIN) and thus will be available to scholars across the country.

The second SDF grant provides for a System Development Archives and History Project, which will guide the long-term expansion and enhancement of archival programs relating to the activities of SDC and SDF. The Project will include such activities as the publication and distribution of a guide to the SDF collection at Stanford, a published survey of related archival resources held elsewhere, oral history interviews, the acquisition and processing of additional archival material, stipends and fellowships in support of visiting scholars, and a major exhibition in 1998. The Project, which will benefit from the guidance of an advisory committee composed of librarians, archivists, and historians of science, is scheduled to begin in September 1990 and continue for a period of two decades.

For more information on the System Development Foundation records, contact the Stanford University Archives, Cecil H. Green Library, Stanford University, Stanford, CA 94305 (415-723-4054).

New Publications . . .

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

Peter Povey and Reginald A.J. Earl. *Vintage Telephones of the World.* IEE History of Technology Series, vol. 8. London: Peter Peregrinus Ltd., 1988. 202 pp.

Vintage Telephones is a popular, rather than a technical, history of the development of the telephone. Povey and Earl state that they wanted "to tell the story of the telephone instrument in an interesting and entertaining way....Almost all technicalities have been omitted" (ix). Also, the authors strove for "a truly international standpoint" in their writing. This richly-illustrated book, then, serves as a chronological catalogue of telephones from around the world.

Povey and Earl begin their story with Charles Bourseul's 1854 musing, "I wonder whether electricity could transmit articulate speech," and move on to Philipp Reis's public demonstration of his "telephon" in 1860. They then focus on the work of Alexander Graham Bell and his contemporaries. After this introduction, the authors devote individual chapters to improvements in transmitting and receiving sound and to the proliferation of shapes and sizes for telephones in the late-19th century.

Two chapters discuss special-purpose telephones. The first introduces the telephone's early use as a medium for broadcasting music, theater, news, and religious services. The French Théâtrophone, demonstrated in Paris in 1881, the British "Electrophone," a service inaugurated in 1895, Budapest's "Telefon-Hirmondo," that began broadcasts in 1893, and the Wilmington, Delaware, service, "Tel-musici," started in 1909, are illustrated. The following chapter highlights street telephones for police, fire, and tramway use, public pay phones, and shipboard, miners', and divers' telephones.

The final chapters examine the internal and external changes in telephones as networks expanded in the early-20th century. The introduction of centralized-battery power for all telephones on an exchange, methods of metering calls, switching systems, and the evolution of the dial are discussed, and World War I era military telephones are examined. *Vintage Telephones* concludes with illustrations of changing telephone design, from the candlestick to the desk phone of the 1930s. Povey and Earl end their narrative at this point, stating, "The repercussions from the introduction of plastics and the one-piece telephone case, have lasted until the present day. Instruments designed before these developments can justifiably be described as 'vintage'..." (p. 191).

Peter Povey and Reginald Earl are both former Curators of the British Telecom Museum in Oxford, England. *Vintage Telephones* is the eighth volume in the Institution of Electrical Engineers' History of Technology Series.

Other Recent Books

Herken, Rolf, ed. *The Universal Turing Machine: A Half-Century Survey.* Oxford and New York: Oxford University Press, 1988. 661 pp.

Marvin, Carolyn. *When Old Technologies Were New: Thinking about Communications in the Late Nineteenth Century.* Oxford and New York: Oxford University Press, 1988. 272 pp.

Stevens, John R. *The Derby Horse Railway and the World's First Electric Freight Locomotive.* Glendale, CA: Interurban Press, 1988. 65 pp.

West, Nigel. *The SIGINT Secrets: The Signals Intelligence War, 1900 to Today—Including the Persecution of Gordon Welchman.* New York: William Morrow & Co., Inc., 1988. 294 pp.

Articles

Apgar, Evelyn. "Inventor's Papers Going into Volumes." *The Central New Jersey Home News* 111, no. 41 (20 March 1989): B1.

Aspray, William. "An Annotated Bibliography of Secondary Sources on the History of Software." *Annals of the History of Computing* 9, nos. 3/4 (1988): 291-343.

Bath, William G. "Evolution and Challenges in Signal Processing." *Johns Hopkins APL Technical Digest* (of the Applied Physics Laboratory) 9, no. 3 (July/Sept. 1988): 261-268.

Bedi, Joyce E. "A Resource in Electrical Engineering History." In *Fourth National Conference on Engineering Heritage 1988*, 26-29. National Conference Publication No. 88/14. Barton, ACT: The Institution of Engineers, Australia, 1988.

Bell, Trudy E. "Bell Breakup Plus Five: Mixed Reviews." *IEEE Spectrum* 25, no. 13 (Dec. 1988): 26-31.

Butrica, Andrew. "Paris Conference on Telecommunications History." *Antenna* 1, no.3 (Feb. 1989): 3-4.

Campbell-Kelly, Martin. "Data Communications at the National Physical Laboratory (1965-1975)." *Annals of the History of Computing* 9, nos. 3/4 (1988): 221-247.

Dailey, William V., and Terrence K. McMahon. "Process Analyzers—The Early Years." *InTech* 35, no. 9 (Sept. 1988): 133-134.

Erskine, Ralph. "Marian Rejewski and the Chronology of Enigma." *Annals of the History of Computing* 9, nos. 3/4 (1988): 369-370.

Falconer, Isobel. "J.J. Thomson's Work on Positive Rays, 1906-1914." *Historical Studies in the Physical and Biological Sciences* 18, part 2 (1988): 265-310.

Faltas, Sami. "The Invention of Fiber-Optic Communications." *History and Technology* 5 (1988): 31-49.

Frost, Robert L. "Labor and Technological Innovation in French Electrical Power." *Technology and Culture* 29, no. 4 (October 1988): 865-887.

Gannett, Elwood K. "*Proceedings of the IEEE*: The First 75 Years." *Proceedings of the IEEE* 76, no. 10 (Oct. 1988): 1268-1279.

Gmelin, J.A. "The History of the National (Radio) Traffic System—Part 1." *QST* 72, no. 11 (Nov. 1988): 69-71.

Golembeski, Dean J. "(Chester Carlson:) Struggling to Become an Inventor." *American Heritage of Invention and Technology* 4, no. 3 (Winter 1989): 8-15.

Haglöf, Arne. "The Instrument Collection of the Manne Siegbahn Institute." *Uppsala Newsletter*, no. 10 (Fall 1988): 4.

Hall, Stephen S. "The Age of Electricity." In *Inventors and Discoverers Changing Our World*, 44-78. Washington, DC: National Geographic Society, 1988.

Harman, P.M. "Newton to Maxwell: The Principia and British Physics." *Notes and Records* (of the Royal Society of London) 42, no. 1 (Jan. 1988): 75-96.

Hawkins, W.F. "The First Calculating Machine (John Napier, 1617)." *Annals of the History of Computing* 10, no. 1 (1988): 37-51.

Hopper, Grace M. "The Education of a Computer." *Annals of the History of Computing* 9, nos. 3/4 (1988): 271-281.

Jackups, Ron R., Joe F. Raga, Khai D. Le, and John T. Day. "Three Years of On-Line Experience with Computerized Operational Planning." *IEEE Computer Applications in Power* 2, no. 1 (Jan. 1989): 17-20.

Jonsson, Urban. "History of Technology in Sweden." *Uppsala Newsletter*, no. 10 (Fall 1988): 8.

Jurgen, Ronald K. "Sarnoff Labs: 'Still Crazy' but Coping." *IEEE Spectrum* 25, no. 13 (Dec. 1988): 36-39.

Kay, Lily L. "Laboratory Technology and Biological Knowledge: The Tiselius Electrophoresis Apparatus, 1930-1945." *History and Philosophy of the Life Sciences* 10 (1988): 51-72.

Maier, John H. "Thirty Years of Computer Science Development in the People's Republic of China: 1956-1985." *Annals of the History of Computing* 10, no. 1 (1988): 19-34.

Morris, Iwan Rhys. "The Sociology of Sparks: An Episode in the History and Meaning of Electricity." *Social Studies of Science* 18, no. 3 (August 1988): 387-417.

Moynihan, John F. "W.J. Hancock, Engineer and Pioneer Radiographer." In *Fourth National Conference on Engineering Heritage 1988*, 92-97. National Conference Publication No. 88/14. Barton, ACT: The Institution of Engineers, Australia, 1988.

Murphy, Erin E. "Making and Baking those Old-Time Components." *IEEE Spectrum* 26, no. 3 (March 1989): 56-58.

Perry, Tekla S. "Kilby and the IC." *IEEE Spectrum* 25, no. 13 (Dec. 1988): 40-41.

Reid, T.R. "Computers and Chips." In *Inventors and Discoverers Changing Our World*, 246-273. Washington, DC: National Geographic Society, 1988.

Richardson, John, and Brian Bowers. "The Telegraph Arbitration." *IEE Review* 34, no. 11 (Dec. 1988): 433-435.

Rhodes, Richard. "Power Particles." In *Inventors and Discoverers Changing Our World*, 214-245. Washington, DC: National Geographic Society, 1988.

Schmitt, William F. "The Univac Short Code." *Annals of the History of Computing* 10, no. 1 (1988): 7-18.

Smith, H. "The International Commission on Radiological Protection: Historical Overview." *IAEA Bulletin* (of the International Atomic Energy Agency) 30, no. 3 (1988): 42-44.

Stock, John T. "Symposium on the History of Electrochemistry, Toronto, 7-10 June 1988." *Beckman Center News* 6, no. 1 (Winter 1989): 14.

Strebeigh, Fred. "Messages by Wireless." In *Inventors and Discoverers Changing Our World*, 183-213. Washington, DC: National Geographic Society, 1988.

Tomash, Erwin. "The Madrid Promptuary." *Annals of the History of Computing* 10, no. 1 (1988): 52-67.

Tomlin, D.H. "The RSRE (Royal Signals & Radar Establishment): A Brief History, from Earliest Times to Present Day." *IEE Review* 34, no. 11 (Nov. 1988): 403-407.

"Tools for Documenting High-Tech Industry: A Project Report." *Charles Babbage Institute Newsletter* 10, no. 4 (Summer 1988): 1-6.

van Creveld, Martin. "When Technology Goes to War." *American Heritage of Invention and Technology* 4, no. 3 (Winter 1989): 48-55.

Viewager, Arthur L., and Albert S. White. "SCR-270 Radar Development." *IEEE AES Magazine* (of the Aerospace and Electronics Systems Society) 3, no. 2 (Dec. 1988): 3-6.

Voltaggio, Frank. "The SCR-270 in Japan." *IEEE AES Magazine* (of the Aerospace and Electronics Systems Society) 3, no. 2 (Dec. 1988): 7-10.

Wagner, B. "Johann Kravogl und sein 'Elektrisches Kraftrad'." *Elektrotechnische Zeitschrift* 109, no. 17 (Sept. 1988): 804-805.

Weiss, Eric A. "Obituary (of John Grist Brainerd)." *Annals of the History of Computing* 10, no. 1 (1988): 78-79.

Williams, L. Pearce. "André-Marie Ampère." *Scientific American* 260, no. 1 (Jan. 1989): 90-97.

Williams, Michael R. "Babbage and Bowditch: A Transatlantic Connection." *Annals of the History of Computing* 9, nos. 3/4 (1988): 283-290.

Worthington, William, Jr. "(Escalators:) Early Risers." *American Heritage of Invention and Technology* 4, no. 3 (Winter 1989): 40-44.

Zahn, Markus. "The Contributions of Arthur Robert von Hippel to Electrical Insulation." *IEEE Transactions on Electrical Insulation* 23, no. 5 (Oct. 1988): 791-800.

Unpublished Manuscripts

Israel, Paul B. "From the Machine Shop to the Industrial Laboratory: Telegraphy and the Changing Context of American Invention, 1830-1920." Ph.D. dissertation, Dept. of History, Rutgers, The State University of New Jersey, 1989.

Johnston, Stephen L. "The Aircraft Warning System, Hawaii and the Signal Company, Aircraft Warning, Hawaii." *Presented at the 8th Polish National Microwave Conference, Gdansk, 3-7 October 1988.*

Special Issues

IEEE Spectrum, Vol. 25, No. 11, 1988. Spectrum's 25th-anniversary issue looks at developments in electrical engineering technology and at changes in the engineering profession since the magazine's founding in 1963. A large section of the issue is devoted to "Classic Case Histories" which cover the moon lander, digital scopes, the PDP-8, the Pacific Intertie, fiber optics, compact discs, the 1K-bit DRAM, and VCRs.

Briefs . . .

New History Editor

Ronald Kline has been named Associate Editor for History for the *IEEE Transactions on Education*. He replaces James Brittain, who held the position for several years. Anyone interested in publishing an article on the history of electrotechnology in the *Transactions* is invited to contact

Dr. Ronald Kline
Associate Editor for History
IEEE Transactions on Education
School of Electrical Engineering
204 Phillips Hall
Cornell University
Ithaca, NY 14853
(607) 255-4307

MIT Archives Publishes New Guide

Selective Guide to the Collections (Cambridge, MA: Institute Archives and Special Collections, Massachusetts Institute of Technology, 1988. 108 pp.) is a catalogue of archival and manuscript collections that document

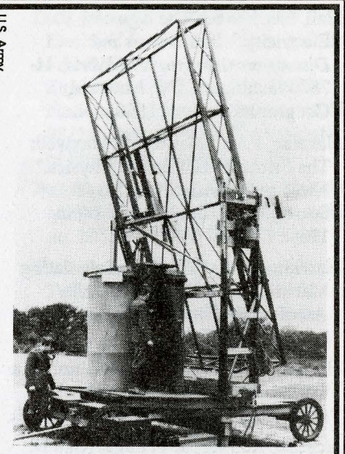
- the founding and growth of MIT and its five schools (Architecture and Planning, Engineering, Humanities, Management, and Science);
- the Institute's educational and research activities, particularly in science and engineering; and
- non-MIT individuals whose activities complement MIT's holdings.

Emphasizing the history of contemporary science and technology and their impact on society, the collections illustrate the growing influence of government and industrial resources on research, as well as the role of academic experts in the formation of science policy.

Copies may be ordered for $7.50 from the Institute Archives and Special Collections, Room 14N-118, Massachusetts Institute of Technology, Cambridge, MA 02139; checks should be made payable to the Massachusetts Institute of Technology.

RadarHist

RadarHist, the Journal of Early Radar Enthusiasts, began publication in 1987 to provide a forum for those with an interest in the history of radar. Working closely with the Historical Electronics Museum in Baltimore, Don Helgeson, *RadarHist*'s editor, has been gathering information on artifacts, archives, and engineers and historians working in this field. He is currently concentrating on locating photographs and apparatus of the BC-403/SCR-270. Anyone with information on this radar, or with an interest in the history of radar, is invited to contact Don Helgeson, Editor, *RadarHist*, 9200 Bennett, Skokie, IL 60076 (312-676-4604).



U.S. Army

This 110 MHz transmitting antenna was used in the Army's radar tests of May 1937.

Bakken Offers Grants

The Bakken Library and Museum of Electricity in Life is offering grants-in-aid to researchers wishing to use its collection of books, instruments, and archival material that documents the history and applications of electromagnetism in the life sciences. Grants of up to $1,000 are available to scholars at all levels; applicants should submit a brief research proposal and a complete curriculum vitae. Send applications and inquiries to John E. Senior, Director, The Bakken, 3537 Zenith Avenue South, Minneapolis, MN 55416 (612-927-6508).

Meetings . . .

Minnesota Seminar

The Spring series of Minnesota Seminars in the History of Science and Technology has been announced. Upcoming talks of special interest to *Newsletter* readers include Margaret Morrison's (University of Minnesota) paper on "Maxwell's Electromagnetism: A Study in Theory Unification" on 12 May and Ole Knudsen's (University of Aarhus) presentation on "A. Willard Gibbs and the Electromagnetic Theory of Light" on 24 May. The Minnesota Seminar is sponsored by the Program in the History of Science and Technology at the University of Minnesota. For further information, contact Maurine Bielawski (612-624-7069) or Roger Stuewer (612-624-8073).

IEE History Weekend

The IEE Science, Education, and Technology Division (Professional Group S7) will hold its annual history weekend on 7-8 July. For program details, contact the Institution of Electrical Engineers, Savoy Place, London WC2R 0BL, England (01-240-1871).

History of Electricity, Paris

The Second International Conference on the History of Electricity will be held in Paris on 20-22 June. Papers will focus on electricity before 1789, electrical and electrotechnical sciences, and the electrical industry worldwide. For details, contact the Association pour l'Histoire de l'Electricité en France, 9, Avenue Percier, 75008 Paris, France (1-47-642453).

Transistor Milestone

The new transistor, an amazingly simple device capable of performing many of the functions of an ordinary vacuum tube, is about to become a full-fledged member of the Allentown Plant's family of electronic products.

The Electronicle of the Western Electric Allentown Plant, October 1951.

On 23 December 1947, three Bell Labs physicists demonstrated a device developed during their research on semiconductors to a few of their colleagues. The transistor, as John Bardeen, Walter Brattain, and William Shockley called it, consisted of a triangular wedge of gold-foil-covered plastic whose point rested on a slab of germanium. The transistor was combined with other components to form an audio amplifier. Brattain recorded the event in his laboratory notebook, writing, "This circuit was actually spoken over and by switching the device in and out a distinct gain in speech level could be heard and seen on the scope presentation with no noticeable change in quality. By measurements at a fixed frequency in it was determined that the power gain was the order of a factor of 18 or greater." A replacement for the vacuum tube was becoming a reality.

The point-contact transistor was publicly demonstrated six months later. The *Bell Laboratories Record* of August 1948 documented the event.

> An amazingly simple device, capable of performing efficiently nearly all the functions of an ordinary vacuum tube, was demonstrated publicly for the first time on June 30 in our West Street auditorium.
>
> Known as the Transistor, the device works on an entirely new physical principal discovered in the course of fundamental research into the electrical properties of solids. Although the device is still in the laboratory stage, it is expected to have far-reaching significance in electronics and electrical communication (p. 321).

In October 1948, the Western Electric Co. formally opened the Allentown (Pennsylvania) Works specifically for the manufacture of electronic components. A branch of Bell Labs was established at the Works, combining the talents of Bell device-development engineers with Western Electric manufacturing engineers. Under the direction of V.L. Ronci, this team orchestrated the transition from experimentation to production. The transistor went into commercial manufacture in October 1951.

On 18 April 1989, transistor manufacturing at Allentown was dedicated as an Electrical Engineering Milestone by the IEEE. Harold Nigh, Allentown Works General Manager, hosted the ceremony held at the Works. The program included talks by M. Ayman Shibib, IEEE Lehigh Valley Section Chairman, on the Milestones program; Joseph Daddona, Mayor of Allentown, on the impact of the transistor and AT&T on Allentown; Mike Thompson, AT&T Product Marketing and Development Vice President, on the impact of the development of the transistor on AT&T; and John Beroset, AT&T MOS Strategic Business Unit, on the impact of the development of the transistor on society. Anna Kopes, who worked on the first transistor production line, recalled the preparation and start-up of the line. A luncheon and tour of the Allentown Works concluded the program.

The IEEE Electrical Engineering Milestones Program seeks to foster awareness of electrical engineering history and to preserve and document significant achievements in electrical and electronics engineering through Milestone site dedications. The Program is supervised by the IEEE History Committee and administered by the Center for the History of Electrical Engineering.

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 have not already done so, please complete the form below and return it to the Center to be certain of receiving future issues.

Name _____

Address _____

_____

_____

IEEE Membership No. (if applicable) _____

Please send information on becoming a Friend of the Center _____

Exhibitions and Museums . . .

Trolley Museums Mark Anniversaries

Shoreline Trolley Museum, East Haven, CT

One of the most important artifacts in the Shoreline Trolley Museum's collection is an early electric freight locomotive from the Derby Horse Railway. The locomotive was built in 1887-88 by the Pullman Palace Car Co. and its 75-HP motor was provided by the Van Depoele Electric Light Co. The Derby Horse Railway operated between Ansonia and Derby, Connecticut, from July 1888 until the fall of 1889. Passenger service continued on the railway's line into the 1930s. After being withdrawn from service, the locomotive was moved into storage and displayed at various locations, including the New York World's Fair in 1939. Then, in 1982, it was purchased at auction by John Stevens, a former Branford Electric Railway Association (BERA) president. Stevens donated the locomotive to the Shoreline Trolley Museum.

In honor of its 100th anniversary, volunteers at the museum restored the locomotive's body and the BERA received a $10,000 grant from the State of Connecticut to rebuild the Van Depoele motor. The motor restoration was completed by the Schultz Electric Co. of New Haven. Last May, after 99 dormant years, the locomotive was running again. It is currently on display at the museum.

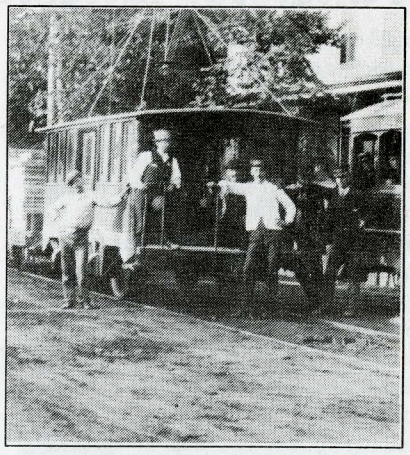
The Shoreline Trolley Museum is located at 17 River Street, East Haven, CT 06512 (203-467-6927).

Seashore Trolley Museum, Kennebunkport, ME

Fifty years ago, the Seashore Trolley Museum was founded with a single artifact—car no. 31 of the Biddeford & Saco line. As the principal activity of the New England Electric Railway Historical Society, Inc., also formed in 1939, the Museum's original goal was the preservation of streetcars. Today, the collection is international in scope and includes all types of transit vehicles, from horse-drawn omnibuses to rapid transit subway and elevated cars. Support vehicles, such as overhead wire repair trucks, are collected as well.

To celebrate its 50th anniversary, a season of special events is planned at the Museum. In-depth guided tours of the collection will give visitors the opportunity to learn more about their specific interests. For example, trackless trolleys and PCC cars will be featured on 6 May, subways and elevated cars on 20 May, and interurban cars on 3 June. Tours with a geographical focus will also be held; 10 June is New England Day, 17 June is Boston Day, and 24 June is Overseas Day. Details of the 50th Anniversary Celebration scheduled for 1-4 July will be available shortly.

BERA



The Derby Horse Railway electric freight locomotive in operation, 1888.

For more information, contact the New England Electric Railway Historical Society, Inc., Seashore Trolley Museum, Post Office Drawer A, Log Cabin Road, Kennebunkport, ME 04046-1690 (207-967-2712).

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