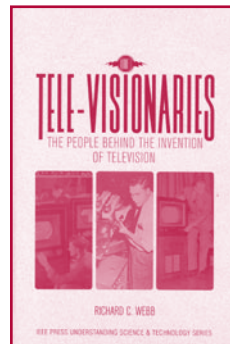


massive machine. Many of the advancements were made by the convergence of engineering, economics, science, mathematics, philosophy and social theory.

The impetus behind *Electronic Brains* appears to be debunking the popular myth that IBM created the computer. Hally explains how IBM became the name most associated with computers. This injustice seems to drive the book. Hally is paying homage to the unsung heroes of the computer, many of whom have passed away unrecognized. Through the use of interviews by those still alive Hally tells these men's and women's stories.

Available from: Joseph Henry Press, \$27.95, cloth, ISBN 0-309-09630-8, xxiii, 275 pp, index.



WEBB, RICHARD C., *Tele-Visionaries: The People Behind the Invention of Television*, IEEE Press, Understanding Science and Technology Series, Hoboken, NJ, September 2005.

Tele-Visionaries: The People Behind the Invention of Television is a portrait of the invention and development of television drawn by one of the engineers present during this period. IEEE Fellow Richard C. Webb worked at RCA from 1939 to 1954, first as a research fellow at Purdue University and later as a staff research engineer. He had personal contact with many of the fellow innovators he discusses. Webb provides a basic chronology of events, but as the title indicates, Webb's focus is on the men behind the technologies, and he introduces the reader to many of the key figures, including Edwin Armstrong (whose work Webb admires), Vladimir Zworykin, and Philo Farnsworth. Webb defends and champions the contributions of David Sarnoff that "greatly accelerated the development of television," and introduces the reader to Roscoe George and Howard Heim, whom Webb worked with at Purdue, and Al Schoeder, a lifelong friend whom he calls "the father of the shadow mask color kinescope which is probably the most important single development in color television history."

While more detailed general histories of television have been written, *Tele-Vision-*

aries does not strive to be such a text. As Webb himself says, "Do not think of me as a historian chronicling all of this . . . I am simply one of the engineers who was there at the time it was happening, and I am just telling you what I saw." He is able to recall such events as his first day of work at RCA Laboratories, through the installation the video-telephone system in the White House, which was completed in 1961, and of meeting Dwight Eisenhower in 1963. Webb also includes an appendix with several photocopied pages of Zworykin's personal copy of the RCA original summary report on the development of the Iconoscope.

Tele-Visionaries is valuable as a first-person account of television's invention and of the people involved. Through his experiences, Webb is able to give the reader a glimpse of what began "the fifty years of visual contact with the expanded neighborhood that is our planet," and the men that made this contact through television possible.

Available from Wiley-IEEE Press, www.wiley.com/ieee, \$49.95, hardcover, ISBN 0-471-71156-X, 162 pp., index.



IEEE History Center

ISSUE 69, November 2005

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STATIC FROM THE DIRECTOR

As I write this, the IEEE History Center is recognizing the 15th anniversary of its arrival at Rutgers University, having just a few weeks ago celebrated the 25th anniversary of its very existence—a double cause for celebration. That means for twenty-five years, my staff and I—and our predecessors—have been beating the drum for public awareness and appreciation of the role of the engineer in history of society. Finally, I am happy to report, we—and our many allies—may be making some headway. Following are four recent examples:

The media coverage of the recent loss of Jack Kilby has shown the impact an engineer can have on our lives. His death was front page news around the world. Newspaper editors grasped that what Kilby accomplished has had a profound effect on development of the world as we know it today, accomplishments at least as important in their way as the work of any politician or civic leader. As *The Guardian* newspaper in the U.K. pointed out, his chips "now control most music and media players, digital cameras, mobile phones and other devices, as well as calculators, computers and games consoles." In other words, the stuff of the modern world!

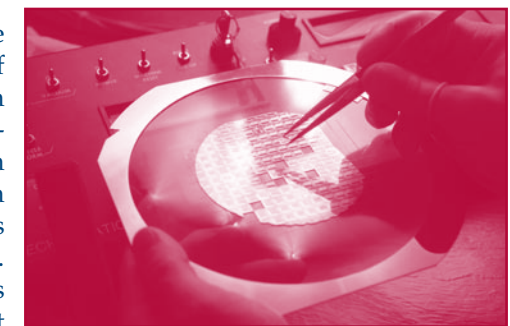
In the recent "Top 25 Greatest Americans of All Time" competition by the Discovery Channel, Benjamin Franklin ranked fifth

(and second only to George Washington among the "Founding Fathers"), Thomas Edison 15th, Bill Gates 18th, the Wright Brothers 23rd, Henry Ford 24th, and Neil Armstrong 25th. Although Franklin's recognition may be more the result of his work as a statesman, civic leader and scientist than as an inventor and engineer, we can still take pride in his high placement on the list. Bill Gates and Henry Ford are probably on the list for their wealth and the economic impact of the companies they founded rather than their technical achievements. Neil Armstrong is there

for being the first human being to walk on the moon, not for the engineering training that enabled him to become the first civilian to enter NASA's astronaut program. Only Edison and the Wrights probably figure in public consciousness as "engineers." Still, it is re-

freshing to see the greatness of all of these engineers recognized by the public and the mainstream media.

Also, just a little while ago we were contacted by the National Television Academy. Several members of their Technology and Engineering Awards Committee felt that the first intercontinental satellite television broadcast by TELSTAR (already an IEEE Milestone) was overdue for recognition by their organization. Their normal procedure is to solicit the nomination from the company involved. Owing to recent



Microchips Are Used in Almost Every Electronic Device



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The newsletter reports on the activities of the Center and on new resources and projects in electrical and computer history. It is published three times each year by the IEEE History Center.

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STATIC FROM THE DIRECTOR (continued from page 1)

corporate developments, however, AT&T was unable to get involved, so the Awards Committee turned to the IEEE History Center. We stepped into the breach and prepared the nomination, and, on 29 September, AT&T was awarded its Emmy for the TELSTAR broadcasts. There were several other IEEE-related technologies whose companies did nominate them (for example, Ampex for the videotape recorder, see www.emmyonline.org for the full report).

Finally, there is the interest of a local secondary school in working with the IEEE History Center to bring science and technology into the social studies and history curriculum (see below).

HISTORY CENTER STAFF TO LECTURE AT HILLSBOROUGH HIGH SCHOOL

As readers of this newsletter know, a key task of the IEEE History Center is to promote appreciation of the role of technology and engineering in society, past and present. Previously, IEEE as a whole – and the History Center in particular – has worked within pre-university science education to help achieve these goals. Pre-university educational standards being promulgated in the United States, as well as those which already exist in some nations, often include aspects of the social and historical appreciation of science and technology.

CORRECTION TO BLACKOUT IMAGE

A number of readers have written to let us know that the image we ran last issue with the article on blackouts was a hoaxed satellite photo, which had been

Our work, however, is far from done. As the recent disasters wrought in the United States by Hurricanes Katrina and Rita attest, the public is all too quick to blame “engineers” when there are infrastructure failures (and to exaggerate those failures—see our blackout retraction below). Rather they should appreciate what engineers have made possible, if only societies would apply their inventions more wisely. We will therefore continue to carry out our mission enthusiastically. Let me then take yet another opportunity to thank you, our supporters, who make the Center’s work possible. And let me wish you and yours a safe, healthy, and happy holiday season and new year.

Through the IEEE Virtual Museum, we have sought to give educators the tools they need to address these standards appropriately. What our readers may not realize is that social studies and history standards that are being promulgated in the United States and elsewhere also explicitly include references to the role of technology in history. It turns out that many social studies teachers are even less comfortable talking about technology than science teachers are in discussing history. That is where the IEEE History Center can come in as experts in the

(continued on page 3)

edited so that it appeared to show the northeastern United States in darkness. Those readers are correct, and to our chagrin, we were hoaxed.

THE IEEE HISTORY CENTER NEWSLETTER ADVERTISING RATES

The newsletter of the IEEE History Center is published three times per annum with a circulation of 10,700 of whom approximately 7,100 reside in the United States. The newsletter reaches engineers, retired engineers, researchers, archivists, and curators interested specifically in the history of electrical, electronics, and computing engineering, and the history of related technologies.

	Cost Per Issue
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Please submit camera-ready copy via mail or email attachment to ieee-history@ieee.org. Deadlines for receipt of ad copy are 2 February, 2 June, 2 October. For more information, contact Robert Colburn at r.colburn@ieee.org.

the inventor of the microchip but also a father of four, a workaholic, and a Midwestern boy who always wanted to make his parents proud.

Leslie Berlin was the 2003-2004 IEEE Life Members Fellow in Electrical History. She is currently a Visiting Scholar in the Program in the History and Philosophy of Science and Technology at Stanford University.

Available from Oxford University Press, www.oup.com, \$30.00, hardcover, ISBN 0-19-516343-5, xi + 402 pages, 50 illus., index



ELECTRONIC BRAINS: STORIES FROM THE DAWN OF THE COMPUTER AGE. Holly, Mike, Joseph Henry Press, Washington, D.C., 2005. Pp. xxiii, 275.

Writing about British computer science pioneer Alan Turing, Mike Holly writes, “Some regard him as the ‘Father of the Computer’ but it rather depends on your

definition of the latter, there being as many fathers as there are definitions.” This statement sums up what *Electronic Brains* is all about: deposing myths that remain about computers, their origins, development, and evolution. Through nine thorough, engagingly personal chapters and an epilogue, Holly successfully demonstrates how World War II, the Cold War, the rise of technical industries and competition contributed to the rise of computers. In the end, Holly argues, the computer was the product of hundreds of brilliant brains that spanned decades and multiple continents.

Electronic Brains is a personal book. It is an uncritical read, full of stories; a book for those who enjoy personal portraits of the people who contributed to one of the greatest inventions in the history of humankind. Rather than focusing on machines, Holly concentrates on people and their legacies. Therefore, those in search of a critical assessment should look elsewhere, as Mr. Holly is only concerned with telling stories, heartfelt ones, and lots of them.

The approach here is interdisciplinary and cross-continental. Ample attention

is given to women and although only mentioned in passing, Holly acknowledges the racism of the industry that relegated Blacks to low-end jobs. The most fascinating chapters focus on Ukraine, Russia, Australia and New Zealand. These chapters are especially successful and persuasive because Holly’s central thesis is that no one person can claim to have invented the computer; it was created over a series of decades and all over the world. The creation was a global phenomenon.

In addition to lucid prose, *Electronic Brains* makes larger connections between the advancements of various forms of technology and the development of culture. Electronics, he argues, could not have developed in the way and rate at which it did without the instability of World War II and the ensuing Cold War.

The first computers weighed upwards to two tons, and when the first machines were shipped to the IRS a crane was needed, and a window and walls had to be knocked out to make room for the

(continued on page 12)

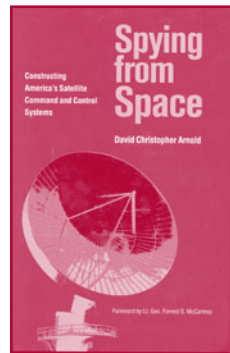
Dear Reader:

Mailing costs for the newsletter have been rising. We are pruning our mailing lists and making sure that only people who wish to receive it do so. We are also interested in finding out whether there is sufficient interest in an electronic version of the IEEE History Center Newsletter to make beginning one worthwhile. Please help us to serve you better by indicating your preferences:

- ___ Yes, please continue to send me the IEEE History Center Newsletter.
- ___ I would be interested in only receiving an electronic version of the IEEE History Center Newsletter when one becomes available.
- ___ I would prefer receiving hard copy of the IEEE History Center Newsletter even if an electronic version becomes available.

Please return cut out and return this portion in the reply envelope included with this issue to:

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USA



ARNOLD, DAVID CHRISTOPHER. *Spying from Space: Constructing America's Satellite Command and Control Systems*. Texas A&M University Press, College Station, 2005.

The ground components of a satellite system, rather than the components which fly, involve "the greatest investment in dollars, research, and industrial personnel" of the system, and it is these command and control systems on the ground which make rockets and satellites useful. Arnold, who was an operations officer at the Diego Garcia Tracking Station, and who now works for the Pentagon, has filled a void in the history of space systems, most of which has previously focused on the satellites and rockets by writing *Spying from Space*.

Spying from Space is a disciplined and detailed history of the Air Force Satellite Control Facility (AFSCF), which was designed for the command and control of reconnaissance satellites. Beginning with a RAND Corporation recommendation in 1951 (but whose concrete development did not begin until March 1958, and which saw its first successful launch in August 1960), AFSCF developed the ground stations to support the tracking and control of the newest form of intelligence gathering.

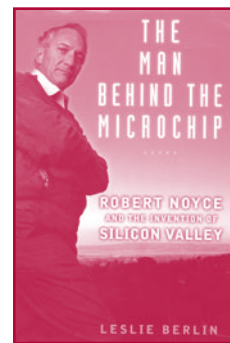
In addition to documenting the building of the technology, Arnold is interested in how large technological systems are constructed and managed, and consciously uses the model articulated by Thomas Hughes to study complex systems.

There were intense bureaucratic battles over which agency was going to control U.S. space efforts, the contenders including ARPA (the Department of Defense's Advanced Research Projects Administration), NASA, the CIA, the Strategic Air Command, or the National Reconnaissance Office. Because of the United States' declared policy of "peaceful uses of outer space," there were many who thought that it would be inappropriate to place all of U.S. satellite efforts under the military. Civilian and military satellite programs diverged very quickly.

ly. Then too there were the design differences between a system developed for operational flights, versus a system designed to support research and development flights (such as NASA's). Although economies of scale seemed to favor developing one system of ground support, rather than duplicating the effort, single systems do not always handle multiple tasks efficiently. (One of Arnold's chapters is titled aptly "Too Many Fingers in the Pie"). The Air Force system was the one it built to serve its own particular needs. Even the reconnaissance requirements of the Air Force and the CIA came into conflict.

Spying from Space is an excellent companion to *Wizards of Langley* [reviewed in Newsletter 63], as the Corona satellite systems figure prominently in both.

Available from Texas A&M University Press, www.tamu.edu/upress, \$48.00, cloth, ISBN 1-58544-385-9, xix + 209 pages, 25 illus., index



Berlin, Leslie, *The Man Behind the Microchip: Robert Noyce and the Invention of Silicon Valley*. Oxford University Press, Oxford, 2004.

In *The Man Behind the Microchip*, Leslie Berlin presents a highly readable, well-researched and well-written biography of Robert Noyce (1927-1990). Berlin begins with Grinnell (Noyce's hometown) residents' memory of Noyce and the meeting of Harriet Norton and Ralph Noyce, his parents. The book ends with Noyce's memorial service and a look at Noyce's lasting contributions to the field and how the industry remembers Noyce. Through Noyce's life and times, Berlin tells the evolving tale of the electronics industry and that of nascent venture capitalism. Noyce's move to California coincided with the massive post-war westward migration. In the late 1950s, electronics was a booming industry and the government was a major customer, accounting for more than half of sales. However, in the late 1970s, the industry experienced a dramatic transformation; government purchased less than a quarter of the integrated circuits sold.

Man Behind the Microchip focuses on Noyce's professional life interwoven with glances into his personal life. Berlin organizes the biography according to the ventures Noyce embarked. For example, chapter three, entitled "Apprenticeship," looks at the period when Noyce worked for Noble Prize winning physicist, William Shockley. For Noyce and for scientists of his generation, Shockley was a well-respected and idolized researcher. Thus, Noyce enthusiastically looked forward to working for Shockley. Things however did not go as well as Noyce anticipated. In chapter four, Noyce, fed up with Shockley's intimidation tactics and his stifling research environment, decides to join seven of his colleagues (Julius Blank, Victor Grinich, Jean Horni, Eugene Kleiner, Jay Last, Gordon Moore and C. Sheldon Roberts) to form Fairchild Semiconductors. These eight men made history; they would dominate the integrated circuit industry in spin-off companies. Noyce's spin-off venture—he was the cofounder of Intel 1968—would surpass his colleagues.

Noyce is best known as the inventor of the first practical integrated circuit (1959), a shrewd businessman and a genius who predicted the technical revolution. Noyce predicted computers would be small enough to carry and individuals would be able to transfer their calls and answer them anywhere. In the first full-length biography of Noyce, Berlin depicts the man behind the name; Noyce was human and full of contradictions. He had flaws but remained likeable. Although extremely competitive, he wanted people to like him. He was worth millions but still maintained a down-to-earth attitude. He believed people worked harder and more efficiently in smaller more intimate environment (he applied this belief to corporations and argued that large corporations were bad). Noyce was a risk taker in both his personal and professional life. Apple Computer's tribute to Noyce aptly captured his essence. He was, "the ultimate inventor. The ultimate rebel. The ultimate entrepreneur."

Man Behind the Microchip has a narrative flow that easily bears the technical discussions sprinkled throughout. Thus, Berlin, having a broad audience in mind, presents Noyce's life story along with his contributions to physics. For Berlin, the two are united. Noyce is not simply

HISTORY CENTER STAFF TO LECTURE AT HILLSBOROUGH HIGH SCHOOL

(continued from page 2)

history of technology—providing supplemental instruction and instructional materials to bring out the technological issues in a curriculum which is already being covered.

After being approached with this problem by a local secondary school near our New Jersey office—Hillsborough High School—we worked with the school to develop a pilot program, which—if it works—could be expanded and also shared with other secondary schools via the Internet and other media. We proposed that Center staff give, initially, three presentations distributed during the year. The presentations will be audio-visual, including live lecture, images, audio clips, and video clips. The lectures assume that the students will have already covered the historical period being discussed, and its other relevant themes. Center staff will then emphasize and elucidate the key technological issues affecting that same period. Staff will also trace the uses and development of those key technologies from their origins predating the historical period under consideration, and also give some foreshadowing of the technological developments

which would come after, to reinforce the continuity of history. In addition, Center staff will be working with Hillsborough faculty to design readings that teachers can use to prepare the students for the lectures and also to follow up afterward.

A key component of this instructional material will be exhibits on the IEEE Virtual Museum. Social studies classes afford the opportunity to reach a broader audience than science classes, and including IEEE Virtual Museum exhibits in social studies lectures could greatly enhance the audience of the Museum.

On 2 November, IEEE History Center post-doc Dr. John Vardalas is scheduled to give a lecture on the role of the magnetic compass and other new navigational technologies in the European expansion of the 16th and 17th centuries. Additional lectures on the industrial revolution and on the telecommunications revolution of the late 19th century will be given next semester by Center Director Dr. Michael Geselowitz and Center Senior Research Historian Dr. Frederik Nebeker, respectively. Look for updates in future newsletters.

STAFF NOTES

SENIOR RESEARCH HISTORIAN FREDERIK NEBEKER CELEBRATES 15 YEARS AT IEEE

The IEEE History Center congratulates Senior Research Historian on the occasion of reaching his 15th anniversary of service to the IEEE. Since coming to the IEEE History Center in 1990, Dr. Nebeker has written several books and numerous articles on the history of electrical technologies, including *Sparks of Genius: Portraits of Electrical Engineering Excellence* (IEEE Press, 1994), *The Evolution of Electrical Engineering: A Personal Perspective* (by Ernst Weber with Frederik Nebeker, IEEE Press, 1994), and *Signal Processing: The Emergence of a Discipline, 1948-*

1998 (IEEE History Center, 1998). With John Bryant, William Aspray, and Andrew Goldstein, he was principal investigator of *Rad Lab: Oral Histories Documenting World War II Activities at the MIT Radiation Laboratory* (IEEE Center for the History of Electrical Engineering, 1993). Most recently he edited *From 0 to 1: An Authoritative History of Modern Computing*, published by Oxford University Press in 2002.

2005-2006 GRADUATE ASSISTANTS

John Adams was born in Chicago, Illinois, raised in Milwaukee, Wisconsin, and received his bachelors degrees in English and history, and a masters degree in African-American Studies from the University of Wisconsin. Currently in his second year in the doctoral program at Rutgers, Adams studies 20th Century American history, with a focus on the Black Civil Rights Movement, gender relations, race and power. His project is a biography of Daisy Bates, the Black woman who was head of the Arkansas NAACP branch during the 1957 battle to desegregate Little Rock's previously all-white Central High School. Adams is interested in the role which advances and developments in technology played in the Black freedom movement. This is a link rarely made beyond the rising popularity of television in the 1950s and 1960s, and the impact which television images played in raising support for the movement. Historians have focused on the images themselves, and have virtually ignored the technological developments and changes that allowed for their dissemination in American society.

The History Center welcomes back **Tracy Eddy** for a fourth year as a GA. Tracy was also the 2005 Life Member Intern this past summer, where she assisted Archival & Web Services Manager Mary Ann Hoffman with the reorganization of the History Center archive. Tracy is a Rutgers alumna in the Rutgers History Department graduate program; her research interests focus on 20th century American political history, and her dissertation examines H.R. Haldeman's role in the Nixon White House. Her minor field is the history of technology and the environment. Tracy has assisted in Center projects such as the Marconi Foundation project, and has written articles for *Today's Engineer* and *The Institute* about topics in the history of electricity, including, "Electronics in the Olympics" and "The Bass Drum Heard 'Round the World': Telarc, Frederick Fennell, and an Overture to Digital Recording," which *Today's Engineer* published this past July.

Joseph Gabriel returns to the Center as a GA (he was a GA in 2000-2001). He has a B.A. in Philosophy and an M.A.

2005-2006 GRADUATE ASSISTANTS (continued from page 3)

in History from the University of Massachusetts, Amherst. He is interested in U.S. social and political history, the history of medicine, the history of race, and global history. He is writing his dissertation on the origins of narcotic control before World War I. He is a co-author, with former IEEE History Center Research Historian David Morton, of *Electronics: The Life Story of a Technology*.

Marie Villefranche is a Ph.D. history student at Rutgers University. She was born in Port-au-Prince, Haiti. She earned her B.A. in history and Anthropology at CUNY: Hunter College. At Rutgers, Marie majors in the African Diaspora and minors in African-American history. She is interested in the interactions of Francophone Africans, Francophone Caribbean and African-Americans in Paris and their manipulations of ideas/myth of "egalitarian" France during the 1930s and 1940s.

IEEE LIFE MEMBERS PRIZE PAPER AWARDED TO RICHARD HIRSH



The committee for the IEEE Life Members Prize is pleased to award the prize for 2005 to Richard Hirsh for his article, "Power Struggle: Changing Momentum in the Restructured American Electric Utility System." The committee chose

the article as a well-researched, elegantly written, and wide-ranging account of the restructuring of the US electric power industry since the 1970s. Hirsh weaves together the social, political, and technical aspects of utility deregulation. Drawing on the work of Thomas Hughes, Hirsh uses the concepts of momentum and closure of large systems to bring together these strands and to make a major contribution to our field's

ongoing debate about technological determinism. He shows how policymakers and the public can change the seemingly unalterable trajectory of a large-scale technological system.

Richard Hirsh is a professor of History of Technology and Science & Technology Studies at Virginia Tech. He holds an undergraduate degree in history, a Master's degree in Physics and a Ph.D. in History of Science from the University of Wisconsin. He was a historian for the National Aeronautics and Space Administration, and a research fellow at the Smithsonian Institution's National Air and Space Museum.

Hirsh became interested in the electric utility industry in 1980 after being appointed chairman of a citizen's committee

(continued on page 5)

SURF CITY

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IEEE XPLORE is the Institute's dynamic online delivery system for IEEE online publications. Recently it added more than 12,000 papers and articles published in the Proceedings of the IEEE from 1963 to 1987. The IEEE digital collection now consists of nearly 1.2 million documents. Included are papers from more than 120 IEEE journals, 900 active IEEE standards, and the proceedings of 400 annual conferences. For most of the journals the content dates back to 1988; content from select publications back as far as 1950 was added in 2003.

digitalgallery.nypl.org

NYPL Digital Gallery is the New York Public Library's new image database, developed to provide free and open online access to thousands of high resolution images from the original and rare holdings of its Research Libraries. Spanning a wide range of visual media, NYPL Digital Gallery offers digital images of drawings, illuminated manuscripts, maps, photographs, posters, prints, rare illustrated books, and more. Encompassing the subject strengths of the vast collections of the Research Libraries, these materials represent the applied sciences, fine and decorative arts, history, performing arts, and social sciences.

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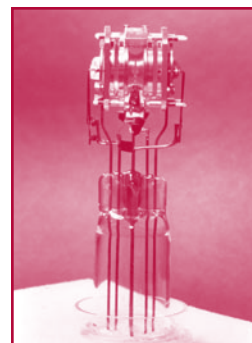
National Academies Press: Memorial Tributes

NAP provides a wonderful service by publishing, for free, its Memorial Tributes online. Simply visit www.NAP.edu and in their "Discovery Engine" type in "Memorial Tribute." All seventeen current titles will appear, and you can look through the list to read excellent biographies of engineers. Examples of biographies are J. Presper Eckert, Sidney Darlington, and Jan Rajchman. There are hundreds of biographies online.

MYSTERY PHOTO CHALLENGE #18

The IEEE History Center maintains a photographic archive of more than 4,700 images. From time to time images are donated without any identification. Can you help identify this photograph? We are interested in any details such as type of equipment, approximate dates, manufacturer, how/where used, and anything else of historical interest you would like to tell us.

The IEEE History Center has a web page that features the mystery photograph. You may email us your answer at iee_history@ieee.org, or you can fill out an on-line form. http://www.ieee.org/organizations/history_center/mystery_photo.html



BAKKEN FELLOWSHIPS AND GRANTS

Each year, the Bakken Library and Museum of Electricity in Life offers Visiting Research Fellowships and Research Travel Grants up to a maximum of \$1,500 to help defray the expenses of travel, subsistence, and other direct costs of conducting research at The Bakken. The minimum period of residence is two weeks. Preference is given to researchers who are interested in collaborating with The Bakken on exhibits or other programs. The deadline for visiting research applications is 20 February 2006.

Travel Grants up to a maximum of \$500 (domestic) and \$750 (foreign) help defray the expenses of travel, subsistence, and other direct costs of conducting research at The Bakken. The minimum period of residence is one week. Application may be made at any

time during the calendar year; there are no deadlines.

The Bakken collections include approximately 11,000 books, journals, and manuscripts, and close to 2,000 instruments and machines. The subject of the collections is the history of electricity and magnetism with a focus on their roles in the life sciences and medicine. For more information about the Bakken collections, go to www.thebakken.org. For application guidelines or further information, please contact: Elizabeth Ihrig, Librarian, The Bakken Library and Museum, 3537 Zenith Avenue So. Minneapolis, MN., 55416, U.S.A. tel 612-926-3878 ext. 227; fax (612) 927-7265 e-mail Ihrig@thebakken.org

NEW INITIATIVES UNDER WAY FOR HISTORIC MENLO PARK

By John Zemkoski, LM and Trustee - Edison Museum

Menlo Park, New Jersey is where Thomas Alva Edison developed the technologies that changed the world. Nicknamed the "Wizard of Menlo Park", he resided and worked there from 1876 to 1884. Major historic milestones that occurred there include:

- Establishment of the first organized industrial research lab in the world 1876
- Invention of the phonograph in 1877 making Menlo Park the "Birthplace of Recorded Sound"
- Demonstration of the first practical incandescent light bulb in 1879
- The first use of incandescent lights for street lighting - New Years Eve 1879
- Invention of the carbon button transmitter for the telephone-the greeting "Hello" was coined by Edison
- Construction of the first electric railroad in the U.S.
- Development of the first electric distribution system

For decades, the Menlo Park site had suffered from benign neglect. The present aged museum building is inadequate for housing the numerous Edison artifacts and memorabilia, and it cannot accommodate large groups of visitors which number approximately 15,000 per year. The one-hundred thirty foot high Edison Memorial Tower, which boasts the "world's largest light bulb" was built in 1938 on the exact location of Edison's original laboratory. The tower, which is a National Historic Landmark, is deteriorating.

However, the future looks promising. During the last few years a curator was hired, a Board of Trustees was established and the site was granted 501C-3 non-profit status allowing the board to solicit private funding. Through the efforts of the trustees and State legislators, the State has initially granted approximately \$650,000 to the site to build a new museum. The

building process will start with an historic site survey and architectural design. A groundbreaking for the new museum is expected in the spring of 2006. While this is occurring, the trustees will focus on fund raising from private sources: individuals, foundations, and corporations. For example, as a result of the sale of a coin commemorating the 125th anniversary of the incandescent light bulb, the U.S. Mint has designated \$379,000 for the site if private matching funds can be obtained by February 2006. Thus, there is urgency to achieve matching funds from the private sector.



Edison Memorial Tower built on the exact location of Edison's laboratory

At the present, the trustees are working with the IEEE History Center and the IEEE Princeton/Central Jersey Section to establish an IEEE Milestone for one of the many inventions associated with the site. In addition, after a design plan for the museum has been developed, the trustees plan to submit proposals to the IEEE Foundation and the Life Members Committee for support of an educational project or museum display. Another opportunity to work together is the 2007 anniversary celebration of the Pearl St. station.

After the new museum has been established, the attention of the trustees will turn to the Edison Memorial Tower which will require significantly more funds to restore it to its original condition. To learn more about the Menlo Park site, the web site is www.MenloParkMuseum.com.

CHRISTOPHER MCGAHEY IS 2005-2006 LIFE MEMBERS FELLOW IN ELECTRICAL HISTORY

The IEEE History Committee has selected Christopher McGahey as the 2005-2006 Life Members Fellow in Electrical History. McGahey is a Ph.D. student in the History and Sociology of Technology and Science at Georgia Institute of Technology, Atlanta, Georgia. He earned his B.S. in electrical and computer engineering from Georgia Institute of Technology, and his M.S. in electrical and computer engineering from University of Illinois at Urbana-Champaign.

McGahey's research is on the history of the U.S. quartz crystal industry from 1918 to 1958. He has been the historian of the IEEE Atlanta Section since October 2003.

The IEEE Fellowship in Electrical History supports 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 up to one year of post-doctoral research for a scholar in this field who has received their Ph.D. within the past three years. The stipend is U.S. \$17,000, and a research budget of U.S. \$3,000 is available. The IEEE Fellowship in Electrical History is administered by the IEEE History Committee and sponsored by the IEEE Life Members Committee. Following is research the Fellowship has supported:

PAST FELLOWS AND THEIR TOPICS

1979 Ronald Kline	Steinmetz and the Development of Electrical Engineering
1980 W Bernard Carlson	Career of Elihu Thomson
1981 Robert Rosenberg	Electrical Engineering Education in America
1982 No Award	
1983 Lawrence Owens	Early Career of Vannevar Bush
1984 Andrew Butrica	Telegraphy and Electrical Engineering in France
1985 Paul Israel	Technological Innovation in the Telegraph Industry
1986 Jonathan Coopersmith	Electrification of Russia, 1880-1925
1987 Nelson Kellogg	History of Television
1988 Michael Gunderloy	Computing Activities of National Bureau of Standards
1989 Graeme Gooday	Laboratory-Based Culture in Electrical Engineering
1990 Mark Henry Clark	History of Magnetic Recording
1991 Gabrielle Hecht	Development of Nuclear Power
1992 Sungook Hong	John Ambrose Fleming
1993 Mary Ann Hellrigel	Adoption of Light and Power in Small Town America
1994 Ross Bassett	History of Metal Oxide Semiconductors
1995 David Morton	History of Magnetic Recording
1996 Christophe Lecuyer	Military Electronics Manufacturing
1996 Andrew Robertson	Transfer of automatic control technology between US & Japan
1997 Aristotle Tympas	Transition from Analog to Digital Computing
1998 Gary Frost	Failure of Early Frequency Modulation Radio 1900-1950
1999 Atsushi Akera	Scientific & Engineering Computing since WWII
2000 Thomas Haigh	Managing Information Processing in Amer. Corps.
2001 Cyrus Mody	Scanning Probe Microscopy
2002 Timothy Wolters	Evolution of Naval Combat Information Centers
2003 Leslie Berlin	Entrepreneurship and the Rise of Silicon Valley: The Career of Robert Noyce, 1956-1990
2004 Chen-Pang Yeang	History of radio wave propagation and interferences between 1900 and 1936.

MISCELLANEOUS

TELSTAR SATELLITE RECEIVES TECHNICAL EMMY

The Telstar satellite, launched in 1961, has been awarded a Technology and Engineering Emmy award for its first intercontinental transmission of a live television. The National Television Academy awards technical Emmys to recognize achievements which have advanced the technology of all aspects of the television, cable, and satellite industries. The Telstar transmissions have already been recognized as an IEEE milestone.

IEEE LIFE MEMBERS PRIZE PAPER AWARDED TO RICHARD HIRSH (continued from page 4)

whose job was to create a new rate structure for the Gainesville (Florida) Regional Utilities System. The System had just finished building a new power plant, and now it had to raise rates to pay for it. Working with environmentalists, members of the business community, and others, he won consensus for a rate structure that discouraged wasteful consumption and which experimented with time-of-day rates--a rather severe

break with the utility's traditional growth-oriented policies. His publications include *Technology and Transformation in the American Electric Utility Industry* (Cambridge University Press), and *Power Loss: The Origins of Deregulation and Restructuring in the American Electric Utility System* (MIT Press), as well as articles for *The Harvard Business Review*, *The Electricity Journal*, *Technology and Culture*, and other magazines.

EE IN THE MOVIES

TELEGRAMS

The telegraph flourished for more than a hundred years, producing hundreds of memorable telegraph messages. Schoolchildren used to learn about Samuel Morse's 1844 "What hath God wrought" and about the Ems dispatch, the Kruger telegram, and the Zimmermann telegram (associated with the Franco-Prussian War, the Boer War, and World War I, respectively). Anyone studying Latin is still likely to be told of General Charles Napier's one-word telegram after annexing the province of Sind to British India: "Peccavi" (Latin for "I have sinned"). There is the famous exchange between George Bernard Shaw and Winston Churchill: "Am sending two tickets for first night. Bring friend if you have one." "Regret cannot come to first night. Will come to second night if you have one." The writer Robert Benchley, on assignment to Venice for the first time, telegraphed back to his editor, "Streets flooded. Please advise."

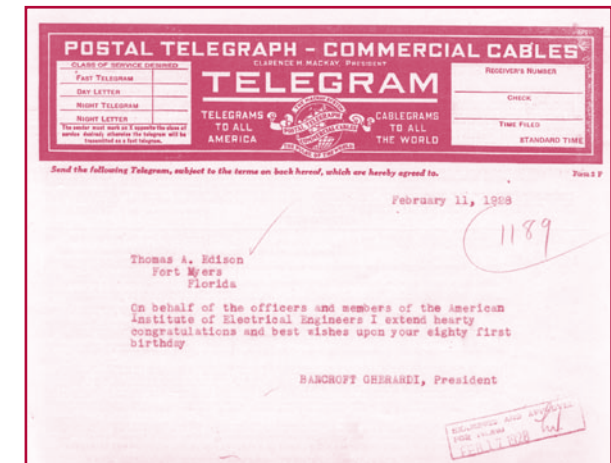
Telegrams have played important parts in countless movies. A crucial event in the Gene Kelly - Judy Garland movie "For Me and My Gal" (1942) is a telegraph clerk's error, turning 'Palace Newark' into 'Palace New York' (which meant that "playing the Palace" was not quite so prestigious). Also in that World War I movie is a telegram informing of a death in action. Noel Coward's "In Which We Serve" (1942) shows the painful task of delivering such telegrams in World War II, and "We Were Soldiers" (2002) shows the same thing for the Vietnam War (where the Western Union telegram was delivered by a taxi driver). Even outside of wartime, telegrams often meant the death of a relative. In "Funny Girl" (1968), the story of Fanny Brice, a Western Union man bicycles up a Lower East Side street, eliciting the comment "That's life for you - somebody's dead."

Though the telephone cut into the telegraph business, there were times when a record of the communication was needed, as with the police telegram in "Spellbound" (1945), or when a long-distance call was thought to be too expensive, as occurs in "Woman of the Year" (1942). Even after telegraph use fell off rapidly in midcentury, it continued to be used when a person was not reachable by telephone, as in "A Man and a Woman" (1966) or "North by Northwest" (1959), where, it is explained, an apartment has not yet been equipped with a phone.

Even if less expensive than a long-distance call, the cost of a telegram could still be an issue. In "It Happened One Night" (1932) and "Romance on the High Seas" (1948), a person short of cash sends a telegram collect. Western Union offered a special price for a message of up to ten words, and people often struggled to get a message down to ten words. If the message was shorter, people often felt they might as well use all ten words, as in "I love you. I love you. I love you. Regards." In "Cabaret" (1972) Sally Bowles (Liza Minnelli) receives a telegram from her father, who was more concerned, it appears, in saving some money than in consoling his daughter, as he was careful not to exceed the 10-word limit. In "The Odd Couple" (1968) Felix Unger sends a suicide telegram to his wife, and Oscar Madison comments, "Can you imagine getting a thing like that? She even had to tip the kid a quarter."

The telegraph practice of indicating the end of a sentence with the word 'stop' was often a source of humor, as in the Marx Brothers' movie "A Day at the Races" (1937) and in the Fred Astaire - Ginger Rogers movie "The Gay Divorcee" (1934). In another Astaire - Rogers movie, "Top Hat" (1935), the foppish clothes designer Alberto Beddini reads aloud the following telegram to Dale Tremont (Ginger Rogers): "Come ahead. Stop. Stop being a sap. Stop. You can even bring Alberto. Stop. My husband is stopping at your hotel. Stop. When do you start. Stop." Alberto then says, "I can't understand who wrote this." Dale replies, "Sounds like Gertrude Stein."

As always, we would be grateful for reports from readers of other interesting movie scenes that involve telegrams. You may contact us at ieee-history@ieee.org.



Telegram from AIEE to Thomas Edison on his Eighty-first Birthday

WALLACE READ BACKS THE IEEE VIRTUAL MUSEUM

By Karen Galuchie, IEEE Development Office

When Wallace S. Read learned that he had been selected as the 2005 recipient of the IEEE Charles Proteus Steinmetz Award, he took great pleasure in refusing the cash award in favor of donating it to two of his favorite IEEE units. The IEEE History Center, specifically the IEEE Virtual Museum (VM), is one of the two beneficiaries of Dr. Read's generosity. The VM will receive U.S. \$5,000 in much needed support to continue its work to present Web-based exhibits in a non-intimidating way that explore how technology works and explain how these technologies have shaped the world in which we live.

As Chair of the Trustees of the IEEE History Center, Dr. Read is intimately aware of the work of the Center. He is quite proud of their efforts and views the IEEE Virtual Museum as an excellent outreach tool. He says, "The IEEE Virtual Museum has won numerous awards and has proven itself as one of the top web pages in North America. It is reaching our youth at a time when they need guidance as they select their career path. I like backing winners and those credentials are enough for me to hope that my small donation will help keep it alive."

Wallace S. Read is the president of Read Management Advisory Services, Inc., St. Johns, Newfoundland, Canada. He

is an IEEE Life Fellow and served as the IEEE president in 1996. His many honors include the IEEE Standards Association International Award, IEEE PES's Power-Life Award, and the Order of Canada.



Dr. Read will receive the 2005 IEEE Charles Proteus Steinmetz Award, which recognizes exceptional contributions to the development of standards in electrical and electronics engineering, during the IEEE Standards Association Award Ceremony in December 2005. The prize honors him for sustained leadership in organizing IEEE standards activities to be responsive to industry and the global marketplace. In addition to the U.S. \$10,000 cash honorarium Dr. Read decided to donate, the other prize items he will receive include a bronze medal and certificate.

To join Wallace (Wally) Read in backing the IEEE Virtual Museum, simply make a gift using the business reply envelope included in this newsletter.

SUPPORT 2006-2007

PROGRAMS OF FINANCIAL SUPPORT FROM THE IEEE HISTORY CENTER: 2006/2007

The IEEE History Center offers three different programs of support annually for scholars pursuing the history of electrical engineering and computing: An internship for an advanced undergraduate, graduate student, or recent Ph.D.; a dissertation fellowship for an advanced graduate student or recent Ph.D.; and a post-doctoral Fellowship for a recent Ph.D. The internship and the dissertation fellowship are funded by the IEEE Life Members Committee; the post-doc is funded by Rutgers University. The internship and the post-doc require residence at the IEEE History Center, on the Rutgers University Campus in New Brunswick, New Jersey, USA; there is no residency requirement for the dissertation fellowship.

IEEE FELLOWSHIP IN ELECTRICAL HISTORY ACADEMIC YEAR 2006/2007

The IEEE Fellowship in Electrical History supports 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 up to one year of post-doctoral research for a scholar in this field who has received his Ph.D. within the past three years. This award is supported by the IEEE Life Members Committee. The stipend is \$17,000, with a research budget of \$3,000.

Candidates with undergraduate degrees in engineering, the sciences, or the humanities are eligible for the fellowship. For pre-doctoral applicants, however, the award is conditional upon acceptance of the candidate into an appropriate graduate program in history at a school of recognized standing. In addition, pre-doctoral recipients may not hold or subsequently receive other fellowships, but they may earn up to \$5,000 for work that is directly related to their graduate studies. Pre-doctoral fellows must pursue full-time graduate work and

evidence of satisfactory academic performance is required. These restrictions do not apply to post-doctoral applicants.

The Fellow is selected on the basis of the candidate's potential for pursuing research in, and contributing to, electrical history. Application forms are available on-line at http://www.ieee.org/organizations/history_center/fin_support.html. The deadline for completed applications is 15 February 2006. This completed application packet should be sent to the Chair-

IEEE HISTORY CENTER INTERNSHIP—2006

Scholars at the beginning of their career studying the history of electrical technology and computing are invited to contact the Center to be considered for a paid internship at the Center's offices on the Rutgers University campus in New Brunswick, New Jersey.

The intern program seeks to provide research experience for graduate students in the history of electrical and computer technologies, while enlisting the help of promising young scholars for the Center's projects. The Intern generally works full-time for two months at the History Center on a Center project that is connected to his or her own area of interest. This time is usually during the summer, but other arrangements will be considered. Interns are also encouraged to consult with the Center's staff and its associates, and guided to research resources in the area. The Internship is designed for those near the beginning or middle of their graduate careers,

man, IEEE Fellowship in Electrical History Committee, IEEE History Center, Rutgers, The State University of New Jersey, 39 Union Street, New Brunswick, NJ 08901-8538. Applicants will be notified of the results by 1 June 2006.

The IEEE Fellowship in Electrical Engineering History is administered by the IEEE History Committee and supported by the IEEE Life Members Committee.

but advanced undergraduates, advanced graduates, and, on rare occasions, recent Ph.D.s will also be considered. Special consideration is often given to scholars from outside the United States who might not otherwise have an opportunity to visit historical resources in this country.

The stipend paid to the intern is US \$3,500, but additional funds may be available to defray travel costs, depending on the Intern's circumstances. This Internship is supported by the IEEE Life Members Committee.

There is no formal application form. To apply, please mail a curriculum vitae showing your studies in electrical history along with a cover letter describing the sort of project you would be interested in doing (see contact information below). The deadline for contacting the IEEE History Center is 1 March 2006.

POST-DOCTORAL FELLOWSHIP IN ELECTRICAL HISTORY ACADEMIC YEAR 2006/2007

The History Department and the IEEE History Center of Rutgers University announce a post-doctoral position for one year, renewable up to three additional years, in the history of electrical engineering and computing, beginning Fall 2006.

The post-doc will participate in the IEEE History Center's program of preserving, researching and promoting the history of electrical engineering and computing and will be expected to conduct original research in related topics. In addition, the post-doc will teach undergraduate courses in the area of the history of technology for the History Department, typically one or two courses per year, and will participate broadly in the intellectual life of the Department, a top-rated program which features a new graduate major field in the history of technology, the environment, and health.

Candidates must hold a Ph.D. in the history of technology or a related field, and must demonstrate the potential to conduct professional-quality scholarship in the history of electrical or computer technologies, broadly defined. Teaching experience and a background in communicating with engineers or a

non-academic audience are all desirable.

Applicants should submit a letter of interest, including a description of areas of research interest, curriculum vitae, writing sample (article or dissertation chapter), and three letters of recommendation. The deadline for completed applications is 1 April 2006.

IEEE and Rutgers are AA/EO employers. Women and minorities are encouraged to apply for all positions.

The IEEE History Center is cosponsored by the Institute of Electrical and Electronics Engineers, Inc. (IEEE)—the world's largest professional technical society—, and Rutgers, The State University of New Jersey. The mission of the Center is to preserve, research, and promote the legacy of electrical engineering and computing. The Center can be contacted at: IEEE History Center, Rutgers University, 39 Union Street, New Brunswick, NJ 08901-8538, ieee-history@ieee.org, http://www.ieee.org/history_center