IEEE History Center

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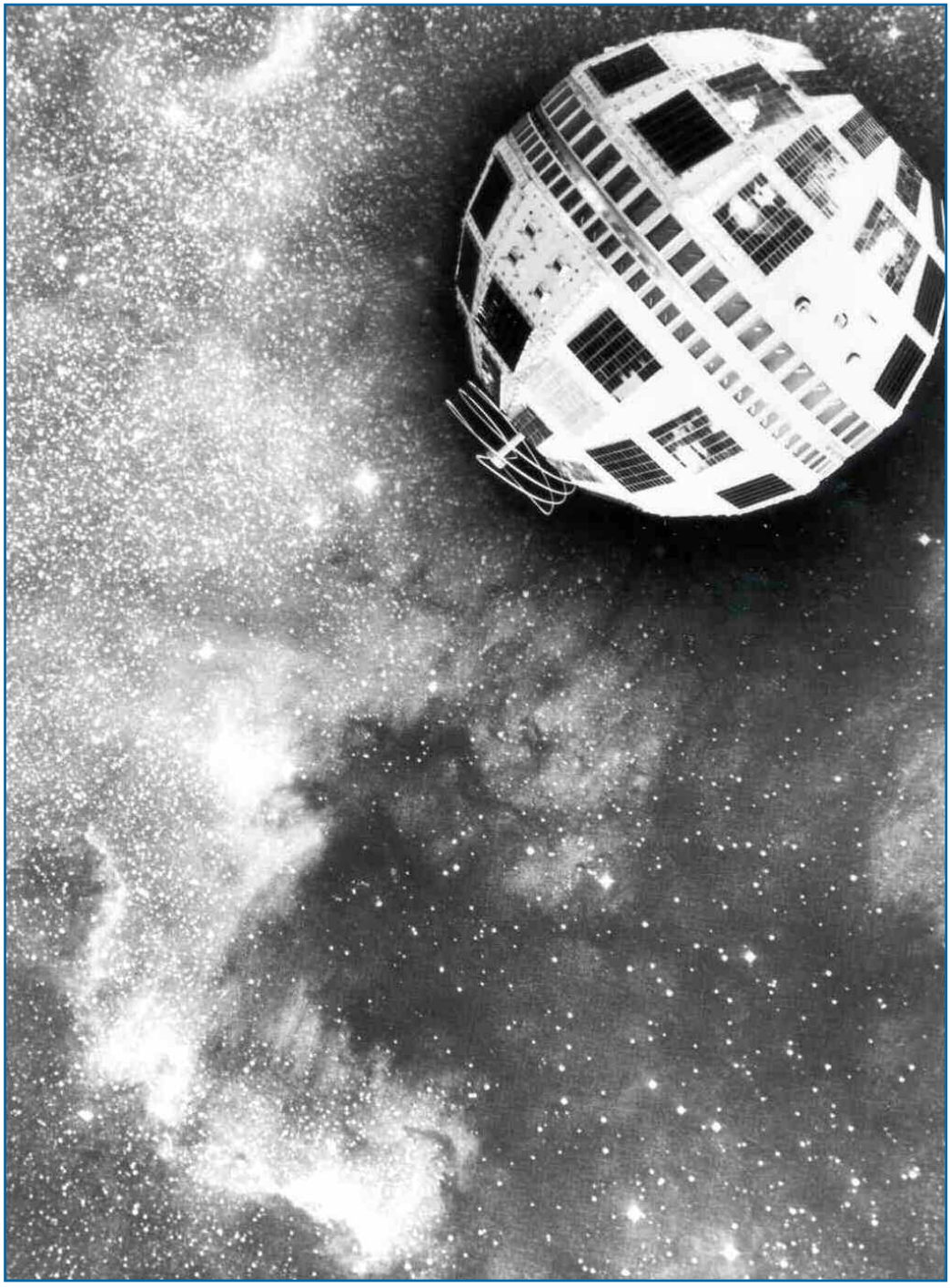

The Telstar *satellite made the first transatlantic television signal transmission 50 years ago. The transmission achievement is an IEEE Milestone.*

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IEEE History Center

The newsletter reports on the activities of the IEEE History Center and on new resources and projects in electrical and computer history. It is published three times each year—once in hard copy (March) and twice electronically (July and November) by the IEEE History Center.

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STATIC FROM THE DIRECTOR

By Dr. Michael N. Geselowitz, Senior Director, IEEE History Center

In certain quarters, the end of the academic year often sees a burst of activity followed by some summer relaxation. Certainly, the months since you received our March newsletter have been full of activity for the IEEE History Center. Besides finishing up our courses at Rutgers and at University of California, Merced, our workshops on history of technology for New Jersey high school social science teachers wrapped up to rave reviews. The Milestones program continued strongly, and our oral history collection saw a significant enhancement with the addition of important interviews of women computer pioneers (see page 4). The anniversary of the *RMS Titanic* disaster—which received a lot of play in the general media—provided IEEE History Center a number of opportunities to promote the history of radio (see, for example, page 3).

Never the less, our summer is looking not less, but even more action packed. It kicks off with a triple Milestone dedication during the IEEE Board Series at the end of June in Boston, and Milestone activity will continue intensively throughout the summer. And although our Milestone recognition of *Telstar* occurred for the 40th anniversary in 2002 (a video of the three-way ceremony among France, the UK and the US can be

Subscription Information

The IEEE History Center newsletter is available free to all persons interested in technological history – whether engineers, scholars, researchers, hobbyists, or interested members of the public. It is published in hard copy in March, and in electronic form in July and November of each year.

To subscribe to the IEEE History Center's free newsletter, please send your name, postal mailing address, e-mail address (optional if you wish to receive the electronic versions), and IEEE member number (if applicable – non-members are encouraged to subscribe as well) to **ieee-history@ieee.org**

Current and past issues of the newsletter can be accessed at: **www.ieee.org/about/history_center/newsletters.html**

The IEEE History Center is a non-profit organization which relies on your support to preserve, research, and promote the legacy of electrical engineering and computing. To support the Center's projects – such as the Global History Network, Milestones, and Oral History Collection, please click the "Donate Online" tab at **www.ieee.org/donate** or **www.ieeefoundation.org/**

NEWSLETTER SUBMISSION BOX

The IEEE History Center Newsletter welcomes submissions of Letters to the Editor, as well as articles for its "Reminiscences" and "Relic Hunting" departments. "Reminiscences" are accounts of history of a technology from the point of view of someone who worked in the technical area or was closely connected to someone who was. They may be narrated either in the first person or third person. "Relic Hunting" are accounts of finding or tracking down tangible pieces of electrical history in interesting or unsuspected places (in situ and still operating is of particular interest). Length: 500-1200 words. Submit to **ieee-history@ieee.org**. Articles and letters to the editor may be edited for style or length.

The IEEE History Center Newsletter Advertising Rates

The newsletter of the IEEE History Center is published three times per annum; one issue (March) in paper, the other two (July and November) electronically. The circulation of the paper issue is 4,800; the circulation of the electronic issues is 22,500. 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
Quarter Page	$150
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Deadlines for receipt of ad copy are 2 February, 2 June, 2 October.
For more information, contact Robert Colburn at **r.colburn@ieee.org**.

found here: **http://www.ieeeghn.org/wiki/index.php/Milestones:First_Transatlantic_Television_Signal_via_Satellite,_1962**), the 50th anniversary this month is affording the IEEE History Center several chances to once again promote the role of engineering and technology in history and society. In August we will be working with the IEEE Electromagnetic Compatibility Society, on the occasion of their 55th anniversary, to serve as a model on how IEEE organizational units can preserve their institutional history taking advantage of our IEEE Global History Network (GHN) platform (see page 4). And, of course, the GHN has continued to grow in content and usage, and I fully expect this trend to continue over the summer as well. Finally, the third quarter of the year will culminate in a trip to Pavia, Italy, for a meeting of the IEEE History Committee, being held in conjunction with HISTELCON 2012, IEEE Region 8's history conference, where History Committee members and History center staff will be participating.

Do not let our frenetic schedule stop you from enjoying a quiet, relaxing summer, if that is your custom. But do let me take still one more opportunity to point out that the continued success of our programs to help preserve and make known the history of IEEE, its members, their professions, and technologies depends in large part on the generosity of you, our supporters. So thank you once again for your assistance, and I hope that we will continue to justify your generosity through the quality of our programs.

In a last, sadder vein, I note the passing of two our longest and strongest supporters, who gave both financially and of their time to the IEEE History Center, and were also giants in IEEE and its fields of interest: Gerald Estrin and Arthur Stern (see page 7). Arthur was a personal mentor to me when he served as Chair of the IEEE History Committee, and both he and Gerry will be sorely missed.

STAFF NOTES

IEEE HISTORY CENTER AND NATIONAL HISTORY DAY

On May 18, IEEE History Center Outreach Historian Dr. Alexander Magoun spent two hours showing twenty-five gifted and talented middle school students from Thomas Grover Middle School in West Windsor, NJ, how they could use subjects related to the history of technology in their National History Day projects for 2013. National History Day attracts more than 600,000 students of all abilities in the U.S. to research and develop competitive responses to an annual theme in categories ranging from research papers to live performances, exhibits, and documentaries. Students prepare their projects independently or in groups on their own time and outside their schools' curriculums. A 2011 evaluation of the program showed that participants outperform their peers in all subjects. (Visit **www.nhd.org** for more information.)

While running the David Sarnoff Library, Dr. Magoun was a finals judge and plenary speaker for New Jersey's NHD program. His continuing association led to this latest engagement, where he connected next year's theme, Turning Points, to people, events, and ideas from the international history of engineering, science, and technology. Magoun also highlighted the History Center's Global History Network, **www.ieeeghn.org**, as a resource for primary sources on IEEE's wide range of technologies that have changed the course of global and national histories. The students responded enthusiastically, several requesting business cards and planning initial research for this summer. The History Center is considering how it might scale up this outreach and encourage more entries related to technological change in future NHD competitions.

TITANIC TIMELINES AND BBC – IEEE HISTORY CENTER IN THE MEDIA

As part of the historic interest in the hundredth anniversary of the sinking of the RMS Titanic, IEEE History Center Outreach Historian Alex Magoun worked with IEEE Spectrum on an interactive timeline showing how the disaster spurred developments in radio technology and radio reform.
spectrum.ieee.org/static/the-titanics-role-in-radio-reform was linked to by The Wall Street Journal – subsequent traffic was so large it crashed the Tik Tok web site!

History Center Senior Staff Director Michael Geselowitz was interviewed on BBC-5 radio's program "Up All Night" on 23 May on the life, work and impact of Eugene Polley, who invented the first wireless television remote control. The broadcast can be heard at: **www.bbc.co.uk/iplayer/episode/b01hwdg2/Up_All_Night_23_05_2012/** (advance your pointer to 1:38 to get to that part of the program.)

The June 2010 history column on "The Making of Football's Yellow First-and-Ten Line"
www.todaysengineer.org/2010/Jun/history.asp written by the History Center's Outreach Historian John Vardalas for IEEE's Today's Engineer received more than 50,000 visitors in May. It was picked up on Hacker News and seems to have enjoyed a bit of viral success as well.

WOMEN IN COMPUTING ORAL HISTORY COLLECTION ON THE GHN

In 1996-1998, Dr. Janet Abbate served as a post-doctoral fellow at the IEEE History Center. Her chief focus during her post-doc was the completion of her book on the history of the internet, *Inventing the Internet* (MIT Press, 1999). Soon after finishing this book, she chose as her next research project a historical study of women computer scientists and engineers, with the goal of writing a book on the subject. As a major part of her research for the project in 2001 and 2002, she conducted more than fifty oral histories with American and British women in computing. She contacted the IEEE History Center to see if we were interested in the project and if we would be willing to work with her, and eventually preserve the finished oral histories. Of course, we were interested and agreed.

Now, a decade later she has finished her book, *Recoding Gender: Women's Changing Participation in Computing,* (MIT Press, Fall 2012). With the book's completion, the original oral histories are being made available for the first time to researchers and other interested parties through the IEEE Global History Network. To date, more than thirty of these oral histories are available on the GHN, grouped together as the **"Women in Computing Oral History Project."** The remaining interviews will be posted over the coming year.

Among the oral histories already posted is one with **Mary Lee Berners-Lee**, a programmer on the Ferranti Mark 1, the world's first commercially available computer. She notes she is likely best known as the mother of **Tim Berners-Lee**, the inventor of the World Wide Web. Other interviewees in the series include **Fran Allen**, IBM fellow and compiler expert; **Adele Goldberg**, who while at Xerox Parc was part of the team that developed the object-oriented programming language Smalltalk; and **Ruzena Bajcsy**, who spent thirty years at the University of Pennsylvania, serving as professor and chair of the Computer Science and Engineering Department, as well as founder and director of the university's General Robotics and Active Sensory Perception (GRASP) Laboratory.

Today, Dr. Abbate is Assistant Professor of Science and Technology in Society at the Northern Virginia campus of Virginia Tech University.

GHN UPDATE

FIRST HAND HISTORIES

Authored by David Boslaugh, *No Damned Computer Can Tell Me What To Do! The Story of the Naval Tactical Data System, NTDS* is a sprawling nine chapter recollection of the development of the first digitized weapon system in the US Navy. NTDS was conceived in 1955 and finished at-sea evaluation in 1962, when it was approved for service use. The first computers used in the Naval Tactical Data System were very similar to transistorized versions of Naval codebreaking computers. In addition to the development of the NTDS, Boslaugh details the history of naval weaponry and codebreaking computers, and discusses the challenges of integrating computers into active military vessels. One of the strongest accounts yet to be posted on the GHN, the NTDS story is rich with photographs and diagrams.

Capt. Carl C. Drenkard, a colleague of Boslaugh's, submitted a related history of the Anti-Submarine Warfare Ship Command and Control System. Drenkard was Bureau of Ships Project Officer and Technical Director from 1964 through 1967, and after the initial successful deployment of the NTDS, anti-submarine warfare became the focus of NTDS development.

Senior IEEE Member Roy Merrill submitted three first hand histories relating to his life and career. The first is an overview of his personal life and career which details much of his non-professional activities. *Spanning the Cold War Nuclear Weapons Era: 1956-58 to 1994-2001* discusses Merrill's role in the development of nuclear weapons at Sandia Corporation, the ARIES weapons disassembly facility, and a prototypic system for immobilizing waste plutonium accumulated from nuclear weapons development. *Starting Up Cetus, the First Biotechnology Company - 1973 to 1982* provides for an account of Merrill's role in starting up Cetus with twenty other employees under Pete Farley, where he began by managing the computing facility supporting the Cetus Mass Screening System.

To view these and other First Hand Histories, go to: **www.ieeeghn.org/wiki/index.php/First-Hand:List_of_First_Hand_Histories**

To submit your own First Hand History, log in to the Global History Network and visit the First Hand History landing page: **www.ieeeghn.org/wiki/index.php/Special:FirstHandHistories**

REGION 5 STUDENT BRANCHES

With the assistance of IEEE History Committee member Ted Bickart, the History Center has created stub pages for all of the IEEE Student Branches residing in Region 5, designed to serve as both a pilot project and as a model for integrating the student branches from other regions on the GHN. Student Branch historians and IEEE Members with appropriate ephemera or records from these student branches are encouraged to add to these pages. To view the full list of Region 5 student branches, view the Region 5 page on the GHN: **www.ieeeghn.org/wiki/index.php/Region_5_%28Southwestern_U.S.%29_History**

FOLLOW UP ON 1902 AIEE DINNER PROGRAM SIGNATURE

Many thanks to our many readers who contacted us to identify correctly the mystery signature on the program of the 1902 AIEE Annual Dinner, which we featured in the March 2012 issue of the IEEE History Center newsletter. The signature was that of Sir Percy Sanderson, the British Consul General in New York between 1894 and 1907. Because the guest of honor was Gugliemo Marconi, it was entirely appropriate that the consul be one of the guests.

The *New York Times* article of 14 January 1902 describes the dinner at the Waldorf Astoria in great detail, including the tablets with "St Johns" and "Poldhu" spelt out in electric lights with a cord between them with tiny electric lights making the letter "S" in Morse code. The article notes that Italian Consul, Branchi, was also present.

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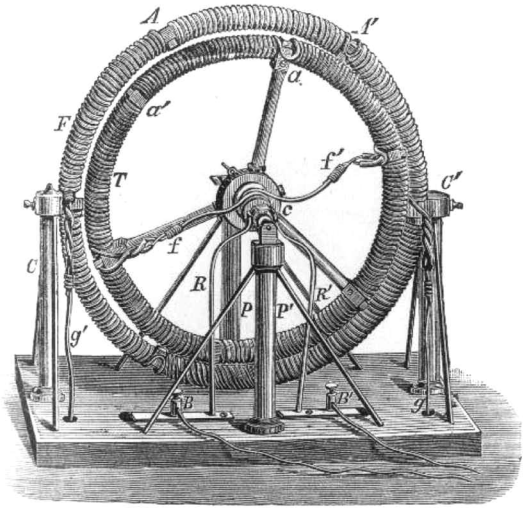

Image courtesy of Smithsonian Institution

MILESTONES

TOKYO SECTION CELEBRATES THE 17TH MILESTONE IN JAPAN

On 5th of April, the dedication ceremony of a new IEEE Milestone the International Standardization of G3 Facsimile was held at the Imperial Hotel, Tokyo. Two Milestone plaques were presented to Mr. S. Miura, the president of Nippon Telegraph and Telephone Corporation, and Mr. T. Tanaka, president of KDDI, from IEEE president Gordon Day. This technology has brought the accurate and efficient transmission of data and images throughout the world.

◄ *From left to right: S. Miura, G. Day, T. Tanaka*

ANTIQUE WIRELESS ASSOCIATION 2012 CONVENTION

The Antique Wireless Association is holding its annual convention on 21-25 August 2012 at the Rochester Institute of Technology Conference Center in Rochester, New York. The dual themes of this year's convention are Collins Radio and the Centennial of the *Titanic*/Marconi Radio.

The Antique Wireless Association is the primary historical association dedicated to preserving and sharing the history of the technologies used for communication and entertainment; including electrical science, telegraph and wired communication, wireless, radio, television, and cellular technologies. Celebrating our 60th year in 2012, AWA is the oldest and largest U.S. organization of its kind with an international membership of approximately two thousand collectors, academics and historians of all ages and from all walks of life.

The collections of the AWA's Antique Wireless Museum, located near Rochester, New York, represent the past 150 years of scientific and technological development including more than 25,000 artifacts, and more than 150,000 vacuum tubes. The museum library contains some 200,000 books, catalogues, magazines, rare documents, slides and photographs, and is the depository for the 100-year historical archive of the Radio Club of America. We receive about 500 visitors and more than 100 research requests annually. Currently, our three-building campus is being expanded to include a world-class museum, library and media center, and a restoration center and exhibit-construction facility.

The AWA Annual World Convention offers four-and-a-half days of total immersion in telegraph, wireless and radio lore. Among its many features are presentations and seminars, competitive contest displays featuring radio equipment and history, a book fair, and a round-the-clock flea market.

The AWA publishes *The AWA Journal*, a quarterly magazine-format bulletin that is a venue for member-authored feature articles and columns. A sister publication, *The AWA Review*, contains longer, more scholarly, member articles. This peer-reviewed publication is issued annually in conjunction with the Convention. AWA also offers a free online quarterly *AWA Gateway* which is intended to help and encourage newcomers to electronics history especially radio. The Gateway offers articles on collecting and restoration at a very basic level.

Membership in the AWA is open to all interested persons. Annual dues: $25.00 per year U.S., $30.00 elsewhere. Visit **www.antiquewireless.org** for more information about AWA including a membership application, or to join immediately via PayPal. The dedicated website **awamuseum.org** includes information about the Convention.

WORLD ELECTRICAL TECHNOLOGY HERITAGE

LORAN TOWER DOCUMENTATION

Historical Architecture and Engineering Record (HAER) is currently processing photographic documentation of two sites related to the heritage of electrical engineering: the KPH/AT&T Point Reyes, CA, Station antennas and the U.S. Coast Guard Cape May, NJ, LORAN Service Unit.

The Point Reyes Station was an assembly of about a dozen antennas which served as the primary West Coast marine wireless station serving the Pacific Ocean region from 1919 to 1997. The antennas are a variety of wire designs, including rhombic, fishbone, double-extended Zepp, and long-wire, with most supported on wooden poles. U.S. Coast Guard Cape May, NJ, LORAN Service Unit has three generations of LORAN-C equipment feeding a hot tower, and it could mimic all U.S. and Canadian LORAN stations to support them when the system was in service between 1942 and 2010. This unit also served as the LORAN Research and Development center.

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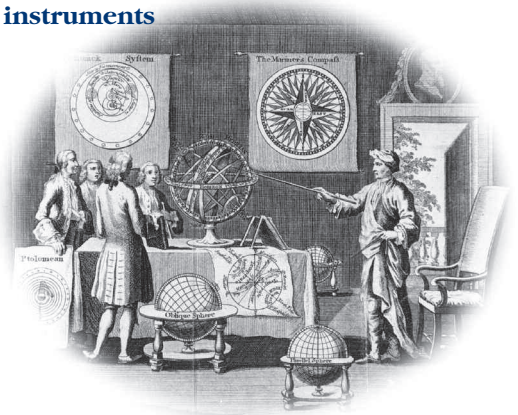

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JOY RANKIN IS 2012-2013 IEEE LIFE MEMBERS FELLOW IN ELECTRICAL HISTORY

The IEEE History Committee has awarded Joy Rankin the 2012-2013 IEEE Life Members' Fellowship in Electrical History.

Joy Rankin

Joy Marie Lisi Rankin, a doctoral candidate at Yale University, studies the history of digital technologies, primarily the history of computing, focusing on the post-World War II era in the United States. Her dissertation addresses personal computing before personal computers by examining interactive computing projects which operated on time-sharing systems during the 1960s and 1970s, namely, the Dartmouth Time-Sharing System, the University of Illinois PLATO (Programmed Logic for Automated Teaching Operations) System, and several education-centered projects across the state of Minnesota, including MECC (Minnesota Educational Computing Consortium). These projects exhibited distinctive characteristics that illuminate the origins of personal computing and how computing technology began to mediate the experience of personhood and of community. Indeed, Rankin is especially interested in how these time-sharing systems fostered the development of user groups, hybrid online-offline communities, and nascent virtual communities. The IEEE Fellowship will enable Rankin to visit relevant archives in New Hampshire, Illinois, Minnesota and California.

Rankin also studies the history of biotechnology, the history of math and science education, science and technology policy, and maps of all kinds. Her other research projects include an examination of the relationship between the Biological Sciences Curriculum Study (BSCS) and the development of molecular biology as a discipline in the United States during the 1960s. The BSCS, comprised largely of professional biologists, was established under the auspices of the American Institute for Biological Sciences during the late 1950s. Within a decade, their high school course materials (including textbooks) dominated the American biology curriculum for college-bound students.

She is also preparing an article offering a close reading of the 1590 White – de Bry *Virginia* map. For many Europeans, this 1590 map of the Virginia territories represented their first glimpse of the geography of the recently-discovered North American lands across the Atlantic Ocean. Commissioned by the Elizabethan court, the German engraver of the map subtly undermined the goals of his English employers.

Rankin graduated *magna cum laude* from Dartmouth College, where she double-majored in mathematics and history, and was elected to Phi Beta Kappa. She received the Harvey Hubbell Incorporated National Merit Scholarship to support her studies at Dartmouth. In fact, her father was employed by Harvey Hubbell Incorporated for 45 years, ultimately as an electrical engineer. His enthusiasm for his work in electrical engineering sparked her interest in the sciences and mathematics, leading to her mathematics major and ultimately to the study of the history of computing.

After college, she enjoyed a successful career launching educational programs ranging from an online ESL (English as a Second Language) website to online Advanced Placement courses for high school students, a career that brought her from Boston to Portland, Oregon to Durham, North Carolina and Geneva, Switzerland. She attained her master's degree at Duke University, concentrating in the history and sociology of science. She currently resides in Cambridge, Massachusetts.

OBITUARIES

OBITUARIES: GERALD ESTRIN AND ARTHUR STERN

The IEEE History Center has lost two strong supporters and champions of history. IEEE Fellow Gerald Estrin and past president Arthur Sloan passed away recently. Both of them were very active in the history efforts of IEEE as well as generous financial supporters of the Center.

GERALD ESTRIN

Gerald Estrin

IEEE Fellow and computer pioneer Dr. Gerald Estrin died 29 March 2012, in Santa Monica, California, at the age of 90. He was born on 9 September 1921 in New York. Estrin received his B.S., M.S., and Ph.D from the University of Wisconsin in 1948, 1949, and 1951 respectively. He served as research engineer in the von Neumann group at IAS from 1950-56. This led to an invitation from the Weizmann Institute of Science in Israel to direct the WEIZAC Project in 1954-5; the WEIZAC Computer is now an **IEEE Milestone in Electrical Engineering and Computing**. In 1968, he became IEEE Life Fellow for "outstanding contributions to university research and education in computers, and to the design and construction of pioneering digital computers."

Gerald Estrin's biography can be found on the IEEE Global History Network at:
http://www.ieeeghn.org/wiki/index.php/Gerald_Estrin

Continued on Page 8

OBITUARIES

ARTHUR STERN

Arthur Stern served on the IEEE History Committee in 2003, and was the Chair from 2004-2006. In addition to his many other accomplishments, he was a gifted raconteur with a host of funny stories, as well as a scholar of Latin and could quote from Cicero's speeches against Cataline extensively. The following obituary is reprinted from *The Institute* online.

Arthur Stern

Stern served as IEEE president in 1975. He was also president of the **IEEE Circuits and Systems Society** and chair of the IEEE History Committee. Stern was a guest editor of *Proceedings of the IEEE and IEEE Transactions on Circuit Theory*. He received several IEEE awards, including the 2000 IEEE Millennium Medal and the 2001 IEEE Haraden Pratt Award for outstanding service to IEEE.

Stern came to the United States in 1951, a Swiss bachelor's degree in electrical engineering in hand, six years after he was freed from the Bergen-Belsen Nazi concentration camp, near Hanover, Germany. He began his career that year as a researcher at General Electric's electronics laboratory in Syracuse, N.Y. In his first two years there, he helped develop color television technology. In 1954 he was promoted to manager of the laboratory's advanced circuits group, where he helped develop solid-state techniques for transistor circuits, radios, and integrated circuits.

Stern left GE in 1961 to head the electronics division of Martin Marietta Corp., in Bethesda, Md. Three years later, Martin Marietta became Bunker-Ramo Corp., and Stern stayed on as its director of engineering. He led the development of advanced mobile missile, command and control, and antisubmarine warfare systems. He was later promoted to director of operations.

In 1966 Stern joined Magnavox's West Coast division in Torrance, Calif., where as vice president he played a key role in developing GPS navigation systems for commercial and military ships. He retired in 1991 as vice chair of Magnavox and president of Magnavox Advanced Products and Systems Co.

Stern received his electrical engineering degree in 1947 from the Swiss Federal Institute of Technology, in Zurich. He earned a master's degree in electrical engineering in 1955 from Syracuse University, in New York.

To learn more about Arthur Stern's life and career, visit the **IEEE Global History Network website** to read his oral history.

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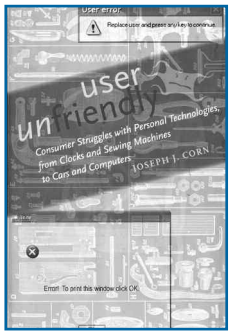
User Unfriendly: Consumer Struggles with Personal Technologies from Clocks and Sewing Machines, Johns Hopkins University Press, 2011



Historian of technology Joseph Corn bought his first computer–an IBM PC with two floppy drives–in 1982, along with a printer. He wanted it to use as a "super typewriter" a better tool for writing. He was struck with just how puzzling, confusing, and user-unfriendly he and, as he soon discovered, other early personal computer users found the computer. Over the years Corn, as a historian of technology, pondered these problems and concluded that they were not new to the computer—but belonged to a broader pattern of the adoption of new personal technologies, which he defines as technologies that an individual must first decide to buy, and then decide on a specific product, and then learn how to use and maintain. The result of his musings some three decades later is this fascinating book, in which the computer occupies only the sixth and last chapter. Corn starts back in the 19th century, with the clock, likely the first novel manufactured technology to become common in the home. The user had to learn how to set the time, how to check the accuracy, and how to keep the clock going—by winding or moving the weights. It was likely the first item sold with printed instructions, though these were short enough to be affixed to the clock itself.

The sewing machine was far more complex. There were many competing models with different features and methods of operations from which to choose. The sewing machine required that the user (almost always a woman) master a new set of skills, because sewing with a machine was very different from sewing by hand. Among these skills were the manipulation of the many parts of the machine, and the routine maintenance, such as oiling and tightening parts. So the sewing machine was the first household product to come with substantial printed manuals and, since parts wore out, an illustrated parts list and instructions on how to order replacements. Other 19th consumer technologies, such as the camera, once George Eastman reconceived it for consumers, proved far more consumer friendly.

For its first twenty-five or thirty years, the automobile proved to be the most highly-desired but user unfriendly consumer technology. Corn devotes four chapters to the auto—covering respectively, buying; running; maintenance, repair, and tinkering; and reading the owner's manual. Until the 1930s, Corn notes that car owners were known as "operators" not "drivers" so complex was their task. Early automobiles were, much as they are today, the most expensive machine most people would ever buy. At least until the rise of the Model T after 1915, there were many small manufacturers, no standardization and no clear criteria to help a would-be user to choose a particular model. Right hand or left hand drive? What type of gearing? Gas, electric, or steam? These were just a few of the questions that had to be answered. And then the owner had to learn how to operate a car which was not similar to anything the owner might have experienced before. There was little instruction available. Operation meant mastering five tasks—starting, steering, selecting the gear, stopping, and supervising the machine while underway. None of these tasks were

easy or familiar. Having finally mastered these, the owner needed to be able to maintain the car. Early cars required lots of maintenance and frequent repair, often after the car broke down on the road. Until the 1920s, repair facilities were few and far between. Finally, the owner had to deal with an operator's manual, often written in bafflingly unfamiliar technical jargon, to try to figure out how to keep the car running.

Finally, in the last chapter, Corn returns to the computer, and shows how the frustration he and other users have had with their computers is akin to what earlier consumers had with earlier technologies. But there's one big difference—even after thirty years, as personal computers have spread from a substantial but niche product for early adopters with particular needs, such as Corn's need for a "super typewriter" to being a near-ubiquitous household appliance, the computer has not succeeded in becoming user-friendly in the ways that sewing machines and cars did. Rather, some problems have persisted since the 1980s, such as the computer malfunctioning for no apparent reason, which sometimes could be solved by turning it off and then on again, though the user has no idea why. And new user-unfriendly problems, like viruses have appeared.

Today, almost everyone uses a computer regularly both at work and at home. And many readers of this newsletter in addition have played roles in the computer's development. This fascinating book makes us look at the computer in a new way—as one of a series of personal technologies which have become widely accepted and have changed our lives, while being problematical, difficult, and, yes, user-unfriendly.

Available from the Johns Hopkins University Press, Baltimore MD. Phone: 1-800-537-5487, Fax: 410-516-6998 **http://press.jhu.edu/books/distribution.html** $55.00, Cloth, ISBN 978-1-4214-0192-8. 264pp., index.

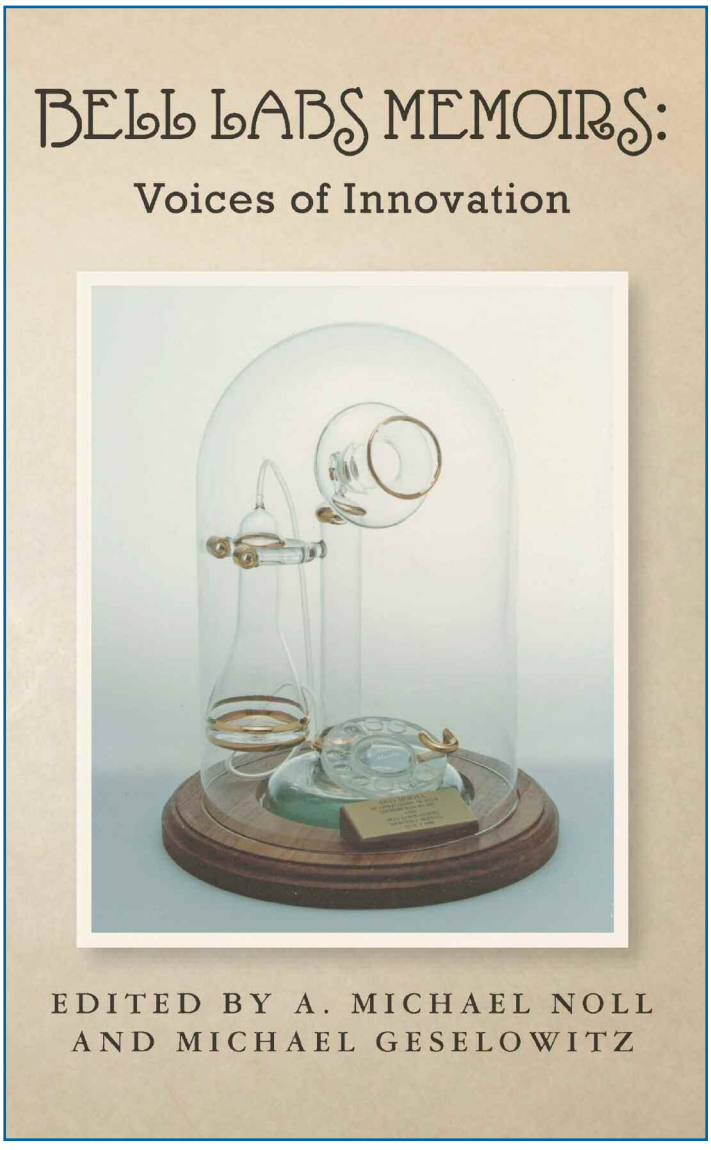
BELL LABS MEMOIRS: VOICES OF INNOVATION

published by the IEEE History Center

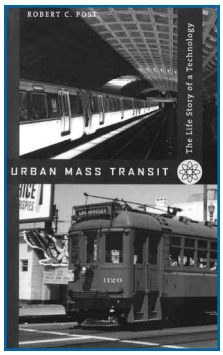
The innovative spirit and creative energy of Bell Labs during the directorship of William Baker are described in this new book by twelve people who worked there. The first-hand accounts are by: John Pierce, father of communications satellites; Manfred Schroeder, speech encoding; Walter Brown, developer of silicon semiconductors; Carol Maclennan, computers and the Ulysses spacecraft; Alan Chynoweth, materials research, David Dorsi, expert glassblower; Edward Zajac, submarine cables and economics research; Edwin Chandross, optical memories and organic materials (inventor of the now ubiquitous light stick); Italo Quinto, chauffer to William Baker; Mohan Sondhi, inventor of the adaptive echo canceller; William Keefauver, Bell Labs' general patent attorney; and lastly, William Baker himself. Through their eyes and words, the culture of Bell Labs comes to life.

The research done at Bell Labs led to many devices and techniques that helped build our present world. Acoustic cameras, adaptive predictive coding, block diagram compilers, cryptography, diamond crystal research, digital communication, echo research, inverse filtering, light-emitting diodes (LEDs), magnetic bubble memories, microwaves, organic field effect transistors, pulse code modulation, synthetic speech, transistors, traveling-wave tubes, and vocoders are among the topics recalled by the contributors to this book.

Available from Amazon.com in hard copy, and also on Kindle at: **http://www.amazon.com/Bell-Labs-Memoirs-Voices-Innovation/dp/1463677979/ref=sr_1_1?s=books&ie=UTF8&qid=1340895623&sr=1-1&keywords=bell+labs+memoirs+voices+of+innovation**



POST, ROBERT C.,
Urban Mass Transit, Johns Hopkins University Press, 2010



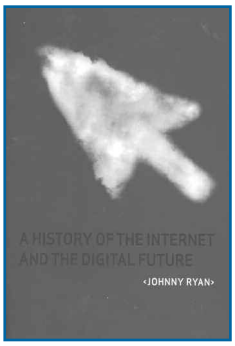
Post's book is primarily a history of the trolley in the United States, from its beginnings before electrification as a horse-drawn tracked vehicle, to the trolley's resurgence as light rail in some U.S. cities beginning in the 1990s. Other forms of mass transit, such as subway and bus, are described relatively briefly, and – in the case of buses – Post tends to view them as competing with the trolley and a cause of the decline of tracked surface transport.

One of the fascinating aspects of Post's book is the revelation of how many words the trolley gave to the language – a sign of how ingrained in 19th and early 20th century American culture they were. The word "trolley" itself coming from the "troller," which was the electrical pickup device which rolled along the overhead wire – itself a combination of the words "traveler" and "roller." "Jitney" (slang for a nickel, which was the fare), "kingpin" (the vital main pin by which the wheel trucks swiveled), and "to get the works" (meaning to buy a complete Brill trolley car: wheels, trucks, motors, everything, instead of buying the coach from one manufacturer and the wheels from another) are just some of the expressions which the trolley bequeathed to everyday discourse.

Chapter 1 describes the state of public urban transit prior to electrification, notably the drawbacks of horses as motive power, and the various mechanical alternatives, such as cable cars, which were tried out before the electric trolley. Chapter 2 describes the success of Frank Sprague's trolley system (Richmond, Virginia, May 1888) with his technique of mounting motors and gearing them directly to the axles, and the spring loaded trolley pole and wheel running on the underside of the overhead wire. Chapter 3 describes the competition to the trolley in the form of private automobiles – which diverted customers from public transit altogether, and buses – which had lower infrastructure costs than trolleys. In Chapter 4, "Rail or Rubber," Post describes the attempts to ward off the competitive threat by designing a more modern streetcar with attractive styling which could be manufactured at a reasonable cost and operated by many city transit authorities. The PCC, the streamlined trolley which was used in many cities from the 1940s through the 1960s, was the result. At the same time the PCC was in service, trackless trolleys, rubber-tired but obtaining their power from overhead trolley lines (many of which remained after the expensive-to-maintain tracks were torn up or paved over) were making inroads in the mass transit offerings available. Chapter 5, "Heavy and Light Rail" documents the trolley's return to the cities of the U.S. in the form of light rail.

Available from The Johns Hopkins University Press, 2715 North Charles Street, Baltimore, MD, U.S.A., 21218-4363; **http://www.press.jhu.edu**, paperback, $27.00, ISBN 978-0-8018-9315-5 xiv +181 pages, index, illustrations.

RYAN, JOHNNY,
A History of the Internet and Our Digital Future, Reaktion Books, 2010



Johnny Ryan's *A History of the Internet and Our Digital Future* is an excellent overview and primer on how the Internet came to be and on some of its emerging, unintended social consequences. Ryan wants the reader to understand that the Internet represents a radical, new democratic opening – one that has yet to be confirmed or seized—one that might yet be squandered if the Internet comes under private or governmental control. Ryan traces this theme from the earliest hypotheses about packet-switching, through the construction of ARPANET and the interventions of the Homebrew Club and on to the familiar examples of Wikipedia and Facebook and all that comes under the rubric of Web 2.0. Throughout, Ryan describes how the emerging technology was fought over between those trying to centralize control of information networks ("centripetal forces") and those committed to keeping the networks open and free ("centrifugal forces"). Ryan is most illuminating in describing just what it is about the technical side of the Internet that allows it to function as a new commons. Principal among the centrifugal forces is what Ryan calls the "hacker ethic" that prevailed among self-motivated computer nerds in Palo Alto and Cambridge, MA. More than anything, their commitment that the best results come from shared access, unrestricted participation and perpetual revision created the democratic possibilities that the Internet offers today.

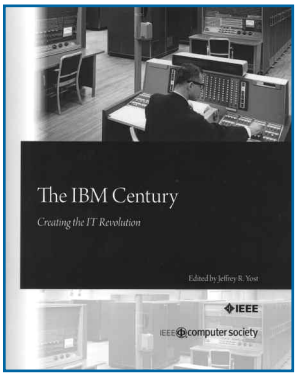
The Internet has changed business and politics, and in both of these realms Ryan sees the Net's democratizing capacities at work. Sites such as Amazon and Craigslist have greatly increased the ability of consumers to communicate with each other, publically judge products, and exchange and barter. Meanwhile, politicians like Howard Dean and Barack Obama have successfully employed feedback and peer-to-peer (P2P) technologies to build (on some levels) participatory campaigns. But the Internet has not changed everything. Ryan is especially entertaining and enlightening when tracing the failed ambitions, misinterpretations, and overestimates of the consequences and the opportunities of the new technology. Ryan recounts not only the dot-com bubble, but also AT&T's curious failure to take a leading role in a technology squarely on its turf; the belated, botched attempts by the communications industry to centralize and privatize information flows; and some of the more poorly conceived tries at using the Internet for political organizing.

Readers well-versed in the history of computing and the Internet will likely find little new information in this volume regarding the birth of the technology. But historians and other readers who are interested in the social, political and business ramifications of the Internet and just how these relate to the technical reality of the Internet will be well served. Ryan's book is pithy and well-written, expansive in its vision and detailed but not tedious. And Ryan is especially adept at describing the basic and essential technical problems, the options available, and solutions chosen in such a way that a reader with only the slightest familiarity with computers can follow.

Available from: University of Chicago Press, 11030 S Langley Ave., Chicago, IL 60628, U.S.A. **www.press.uchicago.edu/index.html** hardback, $27.00, ISBN 978-1-86189-777-0, 246 pages, index

YOST, JEFFREY,

The IBM Century: Creating the IT Revolution, IEEE Computer Society Press, 2011



Some of the younger readers of this Newsletter may not know of IBM's unrivalled dominance of the computer industry throughout the 1950s, 60s, 70s, 80s. On the other hand, readers whose professional lives spanned those years will recall IBM's enormous power in the market place. IBM's supremacy was truly global. During this period the name "IBM" was synonymous with the rise of the information age. At one point, IBM accounted for as much as 90% of the computer industry's products and services. Considerable technical innovation, shrewd business strategies, and very aggressive sales tactics were the cornerstones of IBM's ascendency from its entry into electro-mechanical tabulators in the early 20th century to the most powerful supplier of computer technology in the post-World War II era. Given its enormous market share, it is not surprising that IBM's history was also marked with considerable controversy, particularly on matters related to monopolistic practices. *The IBM Century: Creating the IT Revolution*, edited by Jeffrey Yost, offers a very broad and informative overview of what made IBM what it was.

What makes this volume so fascinating is the compelling set of first-hand accounts that Yost has assembled into one volume. The authors of these accounts offer the reader an insider's view of the key technical and business decisions that shaped IBM's long, and sometimes controversial, history. But it should also be added that none of the articles in this collection are new. They have all appeared before in print. Even though we live in an age where most information is just a mouse click or two away, it is very convenient to have a knowledgeable person sift the available material and offer the reader a well thought out collection of articles. That is what Yost has done. He also complemented these first-hand accounts with an excellent introduction to IBM, an informative time line, and a useful annotated bibliography.

Each of the articles in this volume offers a compelling view of a different -- but key -- facet in IBM's history. These articles also underscore the strong influence that IBM engineering and business decisions had on the overall history of the computer industry. Dr. Watts Humphrey's personal account of IBM's decision to unbundle the pricing of program and systems software from its hardware pricing, serves to remind us that software products were not always sold on their own. The decision to unbundle, as Humphrey's reminds us, was done with specter of the U.S. Department of Justice constantly looking over IBM's shoulder. Would the selling of software and hardware as one irreducible unit be seen as a violation of anti-competition laws? Once the unbundling genie was let out of the bottle, software as a separate business took off. The development and commercialization of the IBM/360 series of computers was not only a great commercial success for IBM, but it also had a profound impact on the industry as a whole. Bob Evans's, who rose to be a vice president in IBM, gives the fascinating overview of the circumstances and decisions that led to the development of this very important computer.

The only fault with this volume is with an omission. The development of the personal computer had a profound impact on us all. The IBM PC played an important role in this story. It is unfortunate that this volume did not include any first-hand, insider account of IBM's strategy for the PC.

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