

IEEE History Center

ISSUE 83, July 2010

Static from the Director1

History Committee Activities2

Center Activities3

Staff Notes5

Things to See and Do5

Communications Security
and History6

EE in the Movies6

Bibliography7

Supporting Historical Preservation....10

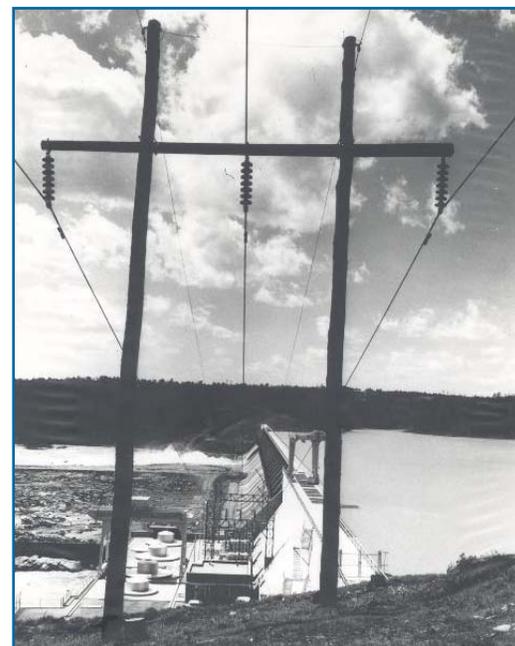
STATIC FROM THE DIRECTOR

The IEEE Newsroom (<http://www.ieee.org/about/news/topics/index.html>) identifies on a regular basis “hot topics” in technology where IEEE and its members are making a difference. The most recent topics have included security, space exploration, and sustainable energy. This outreach effort by our colleagues also enables us to highlight the work of the IEEE History Center, because “what’s past is prologue” (to quote Shakespeare). By preserving, researching and making known our engineering heritage, the History Center allows the public to realize and appreciate that IEEE and its members have been advancing technology for humanity in these and other crucial areas for more than 125 years!

The Milestones Program (<http://www.ieeehcn.org/wiki/index.php/Special:Milestones>), which continues to grow at an increasing pace, has recognized achievements in all these areas. The new STARS Program (<http://www.ieeehcn.org/wiki/index.php/Special:STARS>) will include invited, peer-reviewed articles on the history of major developments in these fields. Our oral history collection includes interviews with many pioneers in these fields; a recent project in partnership with the National Electronics Museum in Linthicum, MD, U.S.A., has strengthened our holdings in the aerospace field. Our other public efforts also frequently feature these fields. For example, in our regular history column in *IEEE-USA Today's Engineer Online*, History Center Research Coordinator (and Newsletter Editor) Robert Colburn recently wrote on the history (“prehistory,” really) of “Smart Grid” (<http://www.todaysengineer.org/2010/May/history.asp>). These themes also pervade

our pre-university outreach reported in the last Newsletter. Finally, a look at “Things to See & Do” (page 5) and “Surf City” (page 5) will reveal that these topics are of interest to the broader historical community.

I believe that the IEEE History Center’s efforts are crucial to raising the profile of the engineer in society, to enhancing technological literacy, and to attracting more young people to pursue technological careers. As always, thanks to you for helping to make these programs possible. Therefore, as a special exclusive bonus for our newsletter readers, we have included an original article on “The Telegraph and Security.”



Smart and the Past and Future Grid: TVA's Chattahoochee Dam. Photo courtesy of the Smithsonian Institution

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 by the IEEE History Center.

Mailing address:
Rutgers University
39 Union Street
New Brunswick, NJ 08901-8538 USA
Telephone: +1 732 562 5450
Fax: +1 732 932 1193
Email: ieec-history@ieee.org
URL: www.ieee.org/history_center

IEEE History Committee 2010

Michael R. Williams, Chair
Jacob Baal-Schem
David E. Burger
Jonathan Coopersmith
Lyle D. Feisel
Mortimer Hans
Lori Ellen Hogan
Daniel D. Hoolihan
Don H. Johnson
Joseph A. Kalasky
W. K. King
Alexander B. Magoun
Thomas J. Misa
Eiichi Ohno
Harold Wallace

IEEE History Committee Staff

Michael Geselowitz, Staff Director
m.geselowitz@ieee.org
Sheldon Hochheiser, Archivist and Institutional Historian
s.hochheiser@ieee.org
Frederik Nebeker, Senior Research Historian
f.nebeker@ieee.org
John Vardalas, Outreach Historian
j.vardalas@ieee.org
Robert Colburn, Research Coordinator
r.colburn@ieee.org
Nathan Brewer, Web Content Administrator
n.w.brewer@ieee.org

IEEE prohibits discrimination, harassment and bullying. For more information visit <http://www.ieee.org/nondiscrimination>

© IEEE information contained in this newsletter may be copied without permission, provided that copies for direct commercial advantage are not made or distributed, and the title of the IEEE publication and its date appear on each copy.

JULIE COHN IS 2010-2011 RECIPIENT OF IEEE LIFE MEMBERS' FELLOWSHIP IN ELECTRICAL HISTORY



The IEEE History Committee has awarded Julie Cohn the 2010-2011 IEEE Life Members' Fellowship in Electrical History. The IEEE Fellowship in Electrical History supports either one year of full-time graduate work in the history of electrical science and technology, 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.

Julie Cohn is a Ph.D. candidate in History at the University of Houston. She holds MA and BA degrees in Anthropology from Stanford University, and has spent her professional career in municipal government and managing university research on application of new technologies for teaching and learning. Her dissertation working title is "Expansion for Conservation: The Growth of North America's Power Grid through the Twentieth Century." Research interests include energy, environmental, and regulatory history, and history of technology. Ms. Cohn has published several book reviews on H-Energy and in *Public Works History Review*. She co-authored articles for *Educourse Quarterly* and has also written entries on energy, utilities, and federal regulation for the forthcoming *Encyclopedia of American Envi-*

ronmental History edited by Dr. Kathleen Brosnan. Prior to returning to graduate school Ms. Cohn held positions at Rice University and the City of Houston and served on the boards of numerous non-profit corporations including the Collaborative for Children, the Greater Houston Committee to Prevent Child Abuse, and The Parish School. As a project manager and research coordinator, her work encompassed several collaborative projects that joined new technologies, classroom education, and multimedia. She is a member of the Phi Beta Kappa Society, the Phi Alpha Theta Society, the Society for the History of Technology, the American Society for Environmental History, and the Organization of American Historians. Ms. Cohn is the 2009-2010 Research Fellow at the University of Houston Center for Public History.

Ms. Cohn's interest in the North American grid began with childhood visits to electric power stations in the company of her electrical engineer father who developed automated control instruments for the exchange of bulk power. Early detailed discussions about instrument displays led to later curiosity about power sharing and the importance of interconnected systems in modern American life. Ms. Cohn plans to fuse technical, political, social, and economic perspectives on electrification in current and future historical research.

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 ieec-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.

	<u>Cost Per Issue</u>
Quarter Page	\$150
Half Page	\$200
Full Page	\$250

Please submit camera-ready copy via mail or email attachment to ieec-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.

EARLY SOLAR CELLS DONATED TO THE IEEE HISTORY CENTER

In March, IEEE Life Member Manfred “Manny” von Borks contacted the IEEE History Center to see if we would be interested in a 1959 Hoffman solar powered portable radio that he had owned since it was new. We were delighted to accept it, since it represents an extremely early use of what is, a half-century later, a hot technology: solar energy. Soon after, a box arrived containing the radio, as well as a solar cell encased in a clear plastic disk, a small demonstration device consisting of a solar panel attached to a miniature motor, and von Bork’s explanation, which follows:

“At the time I was Manager of Military Electronics for Hoffman Electronics. These items were my personal “toys” and sales props.

The Radio was very expensive, a list price of about \$85, a lot of money in 1959, and I understand only a few were sold. The Hoffman Consumer Products Division “sold” the inventory to our Military Products Division, we used them as corporate gifts to important customers. I personally gave away quite a few, but managed to keep one for myself. The only serious customer for solar powered radios was Fidel Castro; he was then in the jungle fighting for independence and was fully supported by the USA. An agent for Castro with a member of our State Department introduced themselves to me at a cocktail party in Washington. The agent said he thought Castro would like to acquire about 100 units to disperse to his many armed

camps in the Cuban jungle. Castro was operating a mobile AM transmitter keeping his people up-to-date, but few had radios or power. I gave a radio to an agent for Castro. A few weeks later the State Department informed me that Castro loved that little red radio, but wanted a larger one with a big speaker, more power out, and a large solar panel to power it; the State Department would give us the specifications and issue a contract. Before State could get the program going, Castro was out of the jungle and in Havana, war was over, Castro went over to Russia, end of story... I would not be surprised if Castro still has that little red radio I gave him so he can listen to his long on-going taped speeches as he travels around Cuba.”

When History Center staff received the radio, staff took it outside in the sun, turned it on, and discovered that it still worked -- an enduring testimony to the quality of Hoffman’s products.

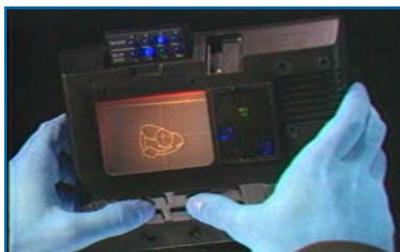


Solar powered portable radio

IEEE GLOBAL HISTORY NETWORK

In May, the IEEE History Center worked with First Insights to conduct a usability study on the Global History Network. After carefully reviewing our own observations of the study, combined with the recommendations from First Insights, we are working on ways to improve the website. Our goal is to not only enrich the content on the GHN, but make the website more user-friendly in a way that will appeal to both IEEE members and the general public. We feel that by making the site easier to navigate and easier to contribute, we will see more user participation from a much broader audience. Most notably, we have just finished with a redesign of the site’s look, making it more streamlined and visually appealing. This change will be the first of many towards a much more efficient Global History Network.

During the past couple of months, the History Center has been expanding the audio/visual material on the GHN. We have uploaded several videos which can be viewed directly on our site. One of the more interesting of these videos is a recruitment video from 1988. Entitled “The Future Awaits”, this video runs about twenty minutes long and was produced to recruit for IEEE student leadership. The film was produced by student branches at McMaster University, Hamilton, Ontario,



“The Future Awaits”

Canada; The Rochester Institute of Technology, Rochester, New York, U.S.A.; and the University of Rochester, Rochester, New York, U.S.A. The video can be viewed here: (http://www.ieeeahn.org/wiki/index.php/Archives:The_Future_Awaits)

Purchased by the IRE in 1946, the historic Brokaw Mansion was home to the IRE headquarters starting in 1946, and was actively used by the IEEE shortly after IRE’s merge with AIEE in 1963. We have posted a history of this beautiful historic house on the Global History Network, which features not only photographs of the exterior and interior, but also a brief silent film shot by IEEE Chief accountant Thomas Bartlett. Shot slightly after the IRE/AIEE merger, the film provides a tour of Brokaw mansion and includes several IEEE employees at work. The article can be viewed here:

(http://www.ieeeahn.org/wiki/index.php/Brokaw_Mansion:_IRE_Headquarters_1946-1963)



IEEE accountant Thomas Bartlett at the Brokaw Mansion

One of the landmark events in the history of nuclear physics was the Westinghouse Atom Smasher. Recognized by the IEEE as a milestone in 1985, the Atom Smasher dedication ceremony was one of the first recognized events in the IEEE Milestone program. We have uploaded a taping of the May 1985 dedication ceremony, which runs about an hour and a half long. Taking place in Pittsburgh, the ceremony can be seen on the Atom Smasher Milestone page: (http://www.ieeeahn.org/wiki/index.php/Milestones:Westinghouse_Atom_Smasher%2C_1937)



Westinghouse Atom Smasher: Milestone dedication video now available on GHN

Providing a unique insight into the past, these historical videos are just some of the more interactive material that we plan to bring to the Global History Network in the future. We feel that videos like these are able to truly enrich an article's content in a way that goes far beyond just images and sound. As we continue to digitize and publish videos from the archives, we encourage contributors to add their own multimedia files to articles

Members share fascinating first-person stories of technological innovations. Come read and contribute your story.

IEEE Global History Network
www.ieeeahn.org

ARCHIVAL NOTES: INEZ HUNT PAPERS ON TESLA BOOK UNITED IN COLORADO

In 2000, The History Center received two boxes of research material and notes collected by author Inez Hunt while she was researching and writing (with Wanda Draper) her biography of inventor (and AIEE Fellow) Nikola Tesla, *Lightning in His Hand: The Life Story of Nikola Tesla*. The boxes have been sitting at the Center untouched ever since, because – although the Center staff recognized their importance and had undertaken to preserve them -- staff were not sure what best to do with them. Because the IEEE Archives' mission is to collect records of the IEEE, there was a sense among staff that the papers would be more useful to researchers and scholars in some other repository. Recently, Archivist and Institutional Historian Sheldon Hochheiser sought to find another home for the material, in a more appropriate context, where they were more likely to be found and used. With a little research, he learned that others of Hunt's papers were held by the Special Collections Department of the Pikes Peak Public Library District in Col-

orado Springs, Colorado, U.S.A, which is where Hunt lived. Amy Ziegler, the archivist there, was delighted to add these records to her collection. By coincidence, the Pikes Peak Library republished Hunt's long out-of-print biography on 17 May 2010, the anniversary of Tesla's 1899 arrival in Colorado Springs to conduct experiments in the wireless transmission of electricity. The library celebrated the publication with a special event, featuring Richard Marold performing the role of Nikola Tesla on the date of his arrival in Colorado Springs, 111 years ago. For further details, see <http://ppld.org/blogs/ppld/?p=1500>

Hochheiser shipped the two boxes to the Pikes Peak Library, where they will be properly cared for, in a context where they are more likely to be found and thus made available to scholars and other interested parties. For further information on Hunt's papers, contact the Library's special collections department at: <http://ppld.org/specialcollections/specialcollectionscontact.asp>

KATHLEEN MANNING IS 2010 LIFE MEMBER SUMMER INTERN

Kathleen Manning, who served as a Rutgers University History Department Graduate Assistant at the History Center for the academic year 2009-2010, has been named the 2010 IEEE Life member Summer Intern.

Kathleen holds a B.A. with Honors in History from Loyola University Chicago and is currently a doctoral candidate at Rutgers, where her dissertation in progress is "In the Company of the Miserable Virgins: Education for Impoverished Girls in

Sixteenth-Century Rome." She has taught courses in European history at Rutgers and Princeton and has worked as an editorial assistant at the Papers of Elizabeth Cady Stanton and Susan B. Anthony.

For her summer project, Kathleen will be working with History Center staff to reorganize and strengthen the history of technology courses that Center staff teach for Rutgers undergraduates as part of the agreement between IEEE and Rutgers.

THINGS TO SEE AND DO

CRYPTOLOGIC HISTORY SYMPOSIUM

The National Security Agency's Center for Cryptologic History sponsors the Cryptologic History Symposium every two years. The next one will be held 6-7 October 2011. Historians from the Center, the Intelligence Community, the defense establishment, and the military services, as well as distinguished scholars from American and foreign academic institutions, veterans of the profession, and the interested public are invited.

The theme for the 2011 conference will be: "Cryptology in War and Peace: Crisis Points in History." Participants will delve into the roles of signals intelligence and information assurance, and how these factors affected and shaped military tactics, operations, strategy, planning, and command and control throughout history. The role of cryptology in preventing conflict and supporting peaceful pursuits will also be examined. The panels will include presentations in a range of technological, operational, organizational, counterintelligence, policy, and international themes.

The Symposium will be held at the Johns Hopkins Applied Physics Laboratory's Kossiakoff Center, in Laurel, Maryland,

U.S.A. Interested persons are invited to submit proposals for a potential presentation or even for a full panel. All serious work on any aspect of cryptologic history will be considered. Proposals should include an abstract for each paper and/or a statement of session purpose for each panel, as well as biographical sketches for each presenter. To submit proposals or for more information on this conference, contact Dr. Kent Sieg kgsieg@nsa.gov.

THE NEW ENGLAND MUSEUM OF WIRELESS AND STEAM

The collection includes artifacts related to early power and communication engineering, primarily from the middle of the 19th century to the mid-20th century. Working stationary steam engines which drove industry — including the last surviving George H. Corliss steam engine running under live steam (now an American Society of Mechanical Engineers International Historic Landmark) — can be viewed. The world's oldest surviving wireless station (it still sparks) is on exhibit, and the first electric light plant of Hartford, CT, U.S.A., built in 1883, is still lighting lights in the museum. The museum is at 1300 Frenchtown Rd., East Greenwich, Rhode Island, U.S.A., www.newsm.org

SURF CITY: WEB SITES OF INTEREST IN TECHNOLOGY HISTORY

A selection of web sites that History Center staff has come across in its work, and hopes may be of interest to readers.

http://semiconductormuseum.com/Museum_Index.htm
The Semiconductor Museum, which includes many interesting oral histories.

<http://www.connected-earth.com/index.cfm>
The Connected Earth is a fascinating and extensive virtual museum on the history of telecommunications, both telegraph and telephone, put together and maintained by BT (British Telecom).

www.bt.com/archives

An illustrated guide to the archives of BT (British Telecom).

<http://www.telegraph-history.org>

An elegant and useful site with articles and images pertaining to U.S. telegraph history.

<http://www.nasa.gov/topics/history/index.html>

Everything you could possibly want to know about the history of spaceflight (from an American angle), by one of the most active history offices in both the US government and in the field of technology.

THE TELEGRAPH AND ON-LINE SECURITY

The American Civil War was perhaps the first “telegraph war” where the telegraph played a pervasive role both in communications and logistics, and also – by means of being tapped – a source of intelligence. As hostilities became imminent, the Federal government began to seize telegraph infrastructure and put it at the disposal of the War Office. E. S. Sanford, of the American Telegraph Company, not only controlled the physical assets, he became a relentless censor as well. Sanford went so far as to delete parts of General McClellan’s dispatch during the June 1862 Seven Day Battle, and Sanford and Major Thomas Eckert (chief of telegraph operations in Washington, D.C.), even dared to withhold from President Lincoln the dispatch announcing the Federal defeat at Ball’s Bluff. Eckert also sat on Grant’s telegraph relieving General Thomas of command until after Thomas had won a decisive victory in Tennessee.

The security risks of the telegraph were well understood. It is likely that the Civil War saw the first systematic use of military ciphers in telegraphy, and thus could be said to herald the consciousness of on-line security. Interestingly, Union generals were not allowed access to their own cipher



An early wiretapping technology: the Telegraph Lineman’s Test Set. Photo courtesy of John Casale www.telegraph-history.org

books. Those were kept under civilian control, and the cipher clerks who encrypted and decrypted messages for them were civilian telegraph company employees.

“Telegraph Scouts” from both sides undertook dangerous missions behind enemy lines in order to tap the other side’s telegraph lines, read the messages, and sometimes send false ones of their own. Sherman frequently tapped Confederate telegraph lines during his march to the sea, and General Ormsby Mitchell lured two Confederate supply trains into an ambush by sending false telegraph messages from Huntsville, Alabama. The scouts’ commonly-used tool was a 15 cm-long Caton “Lineman’s Test Set” sometimes also called a “Pocket Relay.” That one of the world’s first wire-tapping technologies was invented by a judge (John Dean Caton, Chief Justice of the Illinois Supreme Court,) is either ironic or appropriate, depending on your point of view.

“Telegraph Scouts” from both sides undertook dangerous missions behind enemy lines in order to tap the other side’s telegraph lines, read the messages, and sometimes send false ones of their own.

A tapped telegraph wire revealed the hiding place of Lincoln assassin, John Wilkes Booth.

After the Civil War, the telegraph industry developed a code of ethics, and laws were passed protecting telegraphic messages as private communication. Nevertheless, the “security of on-line communication” had already been compromised.

EE IN THE MOVIES

ELECTRICAL TECHNOLOGIES IN THE MOVIES: ESCALATORS AND MOVING WALKWAYS

The first moving stairways were built in the 1890s, and four types were demonstrated at the Paris Universal Exposition in 1900. One of the systems demonstrated there, built by H. Ward Leonard, had a crucial innovation: automatic control of the motor speed, so that variation in the number of riders did not cause changes in speed. An escalator was able to carry more than 8000 people per hour, some 30 times the capacity of an elevator. Thus escalators were favored where traffic was heavy, as in department stores or train stations. Another system demonstrated in Paris in 1900 was designed by Charles Seeberger and built by the Otis elevator company. Otis, which quickly established dominance in the new business, used ‘Escalator’ as its brand name. So dominant, in fact, was Otis that in 1950 a court ruled that ‘escalator’ had become a generic term.

For many people in the early decades of the 20th century, the first place they saw an escalator was in a department

store. The 1936 movie “Modern Times” shows Charlie Chaplin running up a department-store escalator in trying to escape from the police. Probably the most skilled escalator running ever occurs in “Mr. Nice Guy” (1997), where, in a Melbourne shopping mall, Jackie Chan races down escalators, jumping from one to another and sliding down between them. In “What’s Up, Doc?” (1972) two people are talking side by side while one is on the up escalator and the other is walking up the down escalator, and something similar happens in “Leaving Las Vegas” (1995). In “Killing Me Softly” (2002) former lovers see each other for the first time some two years after the breakup; they ride escalators moving in opposite directions, each standing still and staring at the other.

In the 1995 movie “Mallrats”, one of the main characters is in a shopping mall when he sees a boy sitting on one of the steps of a moving escalator. He loudly expresses his opin-

ion that this is terribly dangerous and that the parent is clearly irresponsible. Indeed, in the United States every year, more than a thousand people are injured when hands, feet, or clothing gets caught in escalators. "My First Mister" (2001) also shows someone riding an escalator sitting down, and "Kolya" (1996) shows getting on and off an escalator from the viewpoint of a child.

Another form of electrical transportation, the moving walkway, was introduced at the 1893 Columbian Exposition in Chicago. Five years later one was installed in Harrod's department store in London, and another was built for the 1900 exposition in Paris. Many people hoped that moving sidewalks would relieve the growing congestion of city streets. But nothing came of these hopes, and the device was almost forgotten for half a century. In the 1950s one was installed at a train station in New Jersey and one at an airport in Texas. Thereafter, more and more were built, especially at airports, and by the end of the century they were familiar to most people. The 1960 movie "The Entertainer", starring Laurence Olivier,



A wooden escalator

shows a moving sidewalk at an English seaside resort, and we see several in the Paris Metro in the 1991 movie "Lovers on the Bridge" ("Les amants du Pont-Neuf").

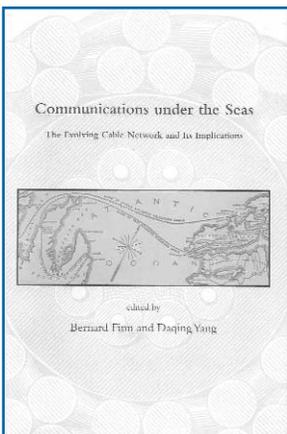
The opening scene of the 1967 movie "The Graduate" shows the character played by Dustin Hoffman on his way home after graduating from college. The scene, where a camera follows him as he stands motionless on a moving sidewalk at the Los Angeles airport, establishes a theme of the movie, that this young man, quite passive and unmotivated from within, is carried along by social expectations. The passiveness of another character, one played by Jack Nicholson in the 2002 movie "About Schmidt", is shown by his standing motionless on an escalator at the Archway Museum in Kearney, Nebraska. In "Panic" (2000) the main character Alex, almost alone in a huge modern building with crisscrossing escalators, is carried along motionless.

Quite a few filmmakers have used moving walkways for comic effect. In "Lucky Break" (1994) someone on a moving sidewalk has to keep walking in order to stay in place to carry on a conversation with friends who are not on the belt, and in "Forget Paris" (1995) two people try to say their goodbyes at an airport while one of them stands on a moving walkway. In "The Rain Man" (1988) the autistic man Raymond seems frozen from anxiety as he stands on a moving sidewalk in Las Vegas, and in "Bean" (1997) the main character, running from police in an airport, goes backwards on a moving sidewalk.

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

BIBLIOGRAPHY

FINN, BERNARD AND YANG, DAQUING, eds. *Communications Under the Sea: The Evolving Cable Network and its Implications*, 2009



From the inauguration of the first successful transatlantic submarine cable in 1866, electrical communications under the sea have played a central role in connecting nations and continents, international diplomacy, and globalization. These cables revolutionized international communications since for the first time a message could move across the oceans more quickly than it could be carried on a ship.

Bernard Finn and Daqing Yang have done everyone interested in this important topic a great service by shepherding this set of essays covering

the 1850s to the 1980s through to publication seven years after their genesis in a two day symposium at the now-closed Dibner Institute for the History of Science and Technology in Cambridge, Massachusetts. Within this period, the emphasis is on submarine telegraphy, which remained the crucial technology into the 1950s.

The essays are grouped into four sections. The opening section contains three essays on the evolution of the technology

itself. In the first piece here, Finn discusses the evolution of submarine telegraph cable technology itself, and the reason for the relative stagnation of the technology for many decades. In the second, Jonathan Reed Winkler examines the successive challenges to submarine technology from radio, telephone cables, satellites, and finally our current dominant technology, fiber optic cables. Finally, Jeff Hecht give the history of the invention, development and deployment of fiber-optic cables.

While domestic telegraph systems were almost everywhere but the United States' were run as government monopolies, international telegraph systems were uniformly built and run by private companies, as the most appropriate means to raise capital and run a business that by its nature was in two countries at once. The companies, however, were always controlled by nationals of a single country. The second group of essays covers this from several viewpoints. Johrma Ahvenson give a brief history of the International Telegraph Union, the international agency formed in Europe to provide rules, regulations, and governance to this industry; Robert Boyce documents the relationship between the British financiers and the British companies that dominated the industry, centering on the 1928 merger between the dominant British cable and wireless (i.e. radio telegraphy) companies to form Cable & Wireless Ltd. Kurt Jacobsen gives a fascinating account of the long-time success of the Danish company the Great Northern Telegraph Company, and how it exploited Denmark's status as a small neutral nation as a key component of its success. And Pascal Griset explores the French response to other country's greater success in

this area.

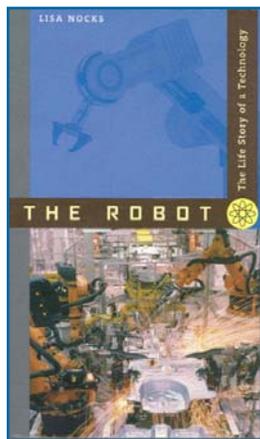
The third group of essays is on the role of cable communications in government activities. Daniel Headrick's article on strategic and military aspects of the cables shows how the British in particular (but other countries as well) used the cables controlled by their nationals as an instrument of foreign policy; a short piece by David Paull Nickles documents how the existence of a means for quick communications at a distance changed the practice of diplomacy, and finally Daqing Yang discusses the role submarine cables played in Japanese imperial ambitions from the 1890s through World War II.

Finally, in a concluding essay, Peter Hugill attempts to bring specific studies together in the broad context of global history and economics.

While this volume exhibits some of the problems inherent in a set of essays, in particular some repetition of background information, it overall admirably meets its goals and provides the first broad account of the history of submarine telegraphy, and its role in world commerce and politics, over the many years from the first successful transatlantic telephone cable in 1866 to the first transatlantic telephone cable ninety years later. It will be of interest to anyone seeking to understand the role of electrical communications in areas such as commerce, diplomacy, and war, as well as anyone who wants to know the background to today's global fiber optic communications networks.

Available from The MIT Press, Cambridge, MA, 800-358-0343, fax: +1 617-625-6660 <http://mitpress.mit.edu>, \$40.00, cloth, ISBN-10: 0-262-01286-3, ISBN-13: 978-0-262-01286-7, 360 pp., index.

NOCKS, LISA,
The Robot: The Life Story of Technology, The Johns Hopkins University Press, Baltimore, 2008



In 1921, Karel Capek's play "R.U.R." premiered in Prague. Soon after, the play opened in New York and then in London. "R.U.R." stood for Rossum's Universal Robots. The word "robot" came from the Czech word "robota", meaning servitude. "Robot" quickly entered the English lexicon and then spread to other languages. Although Capek conceived a "Robot" as an engineered living organism, the term quickly mutated to the present day meaning of an autonomous machine that can carry out human physical tasks. From the moment "R.U.R." appeared in the English speaking world, the possibilities of robots

have captivated both cultural and engineering imaginations. But people's fascination with autonomous behavior has an even longer lineage.

In her book "The Robot: The Life Story of Technology", Lisa Nocks offers up a concise history of robotics. The strengths of this are two-fold: 1) it presents many examples of the long history of inventive activity in self-actuating machines, or automata; and 2) it offers a good summary of the leading edge research in robotics that has been undertaken over the past three decades.

The work of Jacques de Vaucanson (1709 – 1782), in

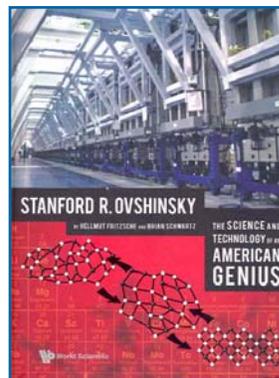
Switzerland, illustrates the inventive activity that surrounded early interest in automata. "By 1738," writes Nocks, "Vaucanson had successfully produced two androids and an ingenious mechanical duck, which were all exhibited at the Hôtel de Longueville, Paris." The term "android" was created in the 18th century to signify an automaton that was humanoid in appearance. One of Vaucanson's androids, the "German-flute player", captivated spectators with the life-like manner in which it moved its head, lips and fingers over the instrument. But Vaucanson's mechanical duck, composed of 400 working parts, held spectators in awe. Nocks cites one observer's reaction: the duck, whose insides were visible, "stretches out its neck to take corn out of your hand; it swallows it, digests it, and discharges it digested by the usual passage, you see all the actions to drive the food to its stomach, copied from nature." The duck even made gurgling sounds as it drank water. While these early automata tried to mimic the movement of living animals and humans, they could not mimic the intelligent, adaptive behavior that characterizes living things.

The "holy grail" of modern day robotics research is the creation of an autonomous entity that can move through, and interact with its environment with the same intelligence exhibited by living creatures. In Chapter 6, Nocks touches on all the latest advances in robotics, albeit in an introductory manner: developments in artificial intelligence, the use of robots in planetary exploration, the Japanese pursuit to replicate the human form and expressions in robots, and the notion of intelligent companions for humans. The author's treatment also incorporates the issues of perception, independence, and even artificial muscles. For the general audience wanting a concise overview of the progress in robotics over the past three decades, this compact volume is an excellent start.

The volume also includes an extensive sixteen-page timeline of humanity's five millennia fascination with autonomous and intelligent machines. For those readers who wish to delve deeper into the history of robotics the book's bibliography includes a good set of readings.

Available from The Johns Hopkins University Press, MA, 800-537-5487, fax: 410-516-6998, email: hfcustserv@press.jhu.edu, <http://press.jhu.edu>, \$19.95, cloth, ISBN 10:0-8018-9071-3, 192 pp, index

FRITZSCHE, HELLMUT AND BRIAN SCHWARTZ,
The Science and Technology of an American Genius: Sanford R. Ovshinsky, World Scientific Publishing Co., 2008



Stanford R. Ovshinsky's holds important patents on nickel-metal hybrid batteries, rewritable CD and DVD discs, non-volatile computer memories, and regenerative fuel cells. *The Science and Technology of an American Genius* is a reprint book of forty-two of Ovshinsky's papers on amorphous materials, optical storage media, photovoltaics, batteries, hydrogen storage and fuel cells, superconductivity, and other topics.

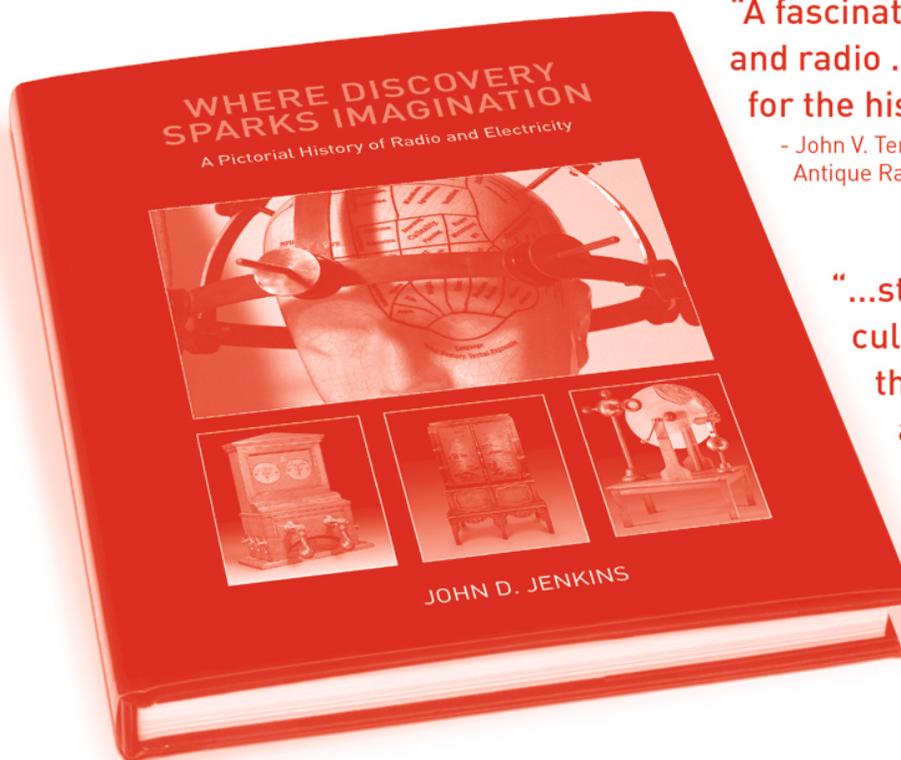
Available from World Scientific, <http://www.worldscibooks.com>, \$76.00, hardbound, ISBN 978-981-281-839-3

“A fascinating pictorial, the unfolding of the bizarre and the beautiful,... that will delight the senses and excite wonder.”

- Robert J. Malone, Ph.D., Executive Director,
The History of Science Society

“If Ben Franklin were alive today, he would have a field day exploring this book — a veritable garden of electrical delights.”

- David J. Rhees, Ph.D., Executive Director,
The Bakken Museum



“A fascinating history of electricity and radio ... an invaluable reference for the historian and collector.”

- John V. Terry, Publisher and Editor,
Antique Radio Classified

“...stories about both the cultural transformations that radio made possible, and the science of electricity itself. A thoroughly worthwhile book.”

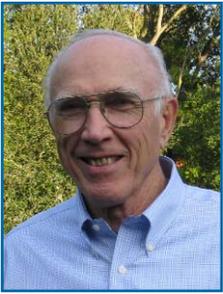
- Steven Turner, Curator,
Smithsonian Institution

The early history of electricity and radio, presented via a marvelous collection of over 600 stunning photographs of actual apparatus, many of which have never before been published.

Anyone who appreciates the amazing workmanship and artistry of old technology will love this book!

NOW AVAILABLE AT WWW.WDSI.US, AMAZON.COM AND OTHER BOOKSELLERS NATIONWIDE

SUPPORTING HISTORICAL PRESERVATION



Dr. Donald L. Nielson
IEEE Life Fellow

Donald Nielson donates generously to the IEEE Foundation and shares with readers the reasons why he will likely continue.

"My respect for the Foundation and its parent organization, the IEEE, is what inspires me to donate. It is important that the Foundation support and preserve the historical record of the profession," Don said.

"In light of the explosive growth over the last half century in both the depth and breadth of technology, the remarkable ability of IEEE to establish the necessary technical record of that progress is breathtaking," he added.

A member since 1955 while attending the University of Idaho, Don is most motivated by the historical mission of the IEEE Foundation but also supports the Life Members Fund and

the IEEE Foundation General Fund.

"The IEEE has adapted meaningfully to the needs of its members through respecting and enabling technological progress in all its forms. I feel that a professional society is essential to the vitality and interests of the profession it represents. In my opinion, among the most important things IEEE supports are: elevating the standards for educational and professional quality, setting explicit technical standards so critical to electrical and communications engineering, and providing the publications that define the progress of the field," he said.

Don has many fond memories of IEEE membership including the satisfaction of publishing IEEE papers and being a contributing editor of a special Proceedings issue. He said, "Other memorable IEEE moments were the surprise of becoming a Fellow and recently accepting for SRI International (formerly Stanford Research Institute) the IEEE milestone plaque as one of two nodes in the first computer network transmission in 1969."

DRAFT YOUR WILL TO MAKE A DIFFERENCE

A Will is one of the most important documents you will ever sign.

A skillfully crafted will:

- lets you direct who receives the property and assets you have accumulated over your lifetime (without a Will, inflexible state rules decide distribution of your assets)
- permits you to nominate who handles your estate and/or serve as guardians of your children
- minimizes death taxes and other costs that deplete your assets can contain a trust providing financial security and money management for someone needing special assistance
- enables you to leave gifts for family, friends, and worthwhile causes, such as the IEEE Foundation

Executing a will is easy, inexpensive and the rewards are great, both in peace of mind and personal satisfaction.

The steps to obtain a will are as simple as 1-2-3:

- Write out all the goals your will should accomplish.
- Make an appointment with your attorney. If you do not have an attorney, ask a friend, relative or contact your local bar association for a recommendation.
- Store your will in a safe place and review it periodically to ensure that it is current with your family needs and your personal desires.

When planning your Will, you may discover that you want to make a difference and leave a legacy in the form of a charitable contribution. Please consider the impact the IEEE History Center has on the preservation, research and promotion of the history of information and electrical technologies.

There are several ways to include a bequest – gift by Will – to the IEEE History Center. Some IEEE members designate a specific dollar amount. Some bequeath a percentage of the 'residue' - the amount remaining after paying all inheritances, debts and costs. Others make the bequest contingent (passing to us only if another beneficiary predeceases you) or in trust, providing income to your spouse or children before benefitting the IEEE History Center. The IEEE Development Office can provide more information about these options.

If you already have a will, great! Keep it up to date and when the time comes to make a change, a simple codicil (amendment) often is all that is needed. If you are considering a codicil, or are reevaluating your Will, please consider adding a bequest to the IEEE History Center. Bequests of any size help perpetuate the professional heritage of electrical engineering and computing.

When you include the IEEE History Center in your will, please share the good news with us by contacting the IEEE Development Office by telephone at +1 732 562 3860 or e-mail at donate@ieee.org. This helps us plan for the future and recognize your generosity during your lifetime by inviting you to join the *IEEE Goldsmith Legacy League*, the IEEE Foundation's elite planned giving donor recognition group.

IEEE Goldsmith Legacy League is named in memory of Alfred N. and Gertrude Goldsmith whose planned gifts seeded the IEEE Foundation's ability to support the mission of the IEEE. Members of the *IEEE Goldsmith Legacy League* are *Forever Generous*. They are building tomorrow by making planned gifts that will benefit future generations. In recognition of their special commitment, members of the *League* receive a keepsake coin, certificate of membership, an invitation to attend the annual IEEE Honors Ceremony, the *IEEE Foundation Focus* newsletter, periodic updates on planned giving, as well as recognition in the annual *Honor Roll of Donors* and on the "Wall of Honor".

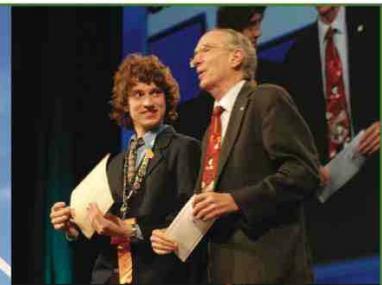
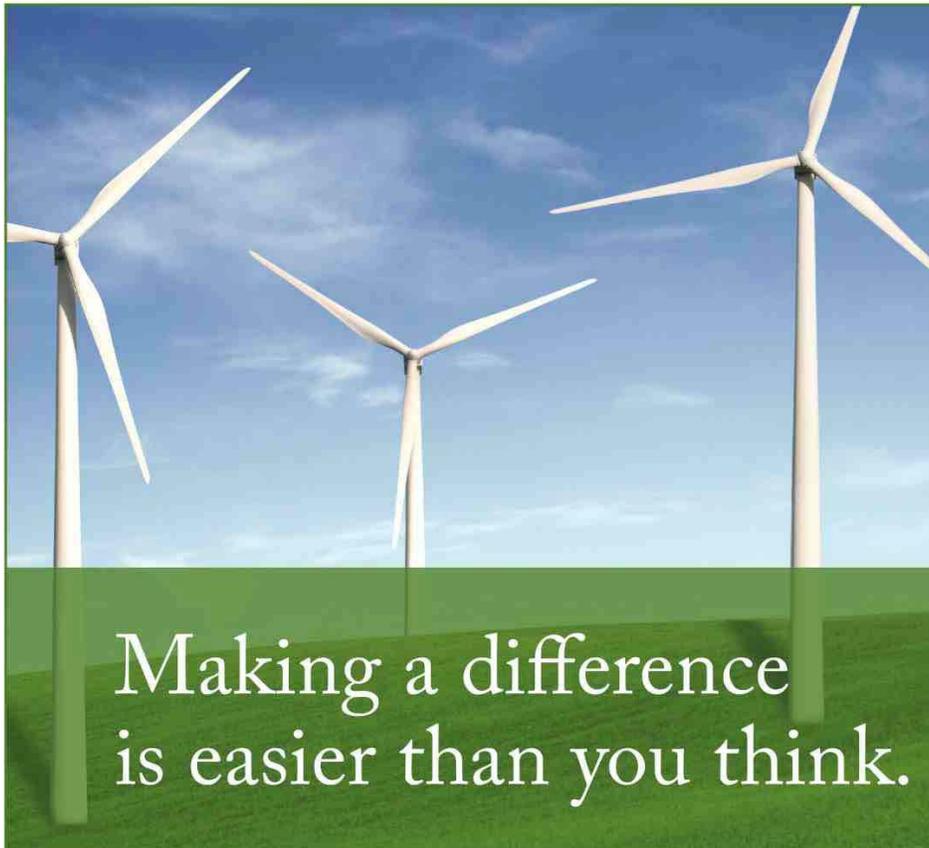
This article adapted from material provided by R&R Newkirk. It is not intended as legal advice. Consult your advisers.

The *IEEE History Center Fund* is one of the 125+ funds administered by the IEEE Foundation, the philanthropic arm of the IEEE. *IEEE History Center Fund* supports the activities of the IEEE History Center to record, archive, and educate the public about the nature of technology and its relationship, both past and present, to society.

Bequests to the IEEE History Center should be worded as follows:

...to the IEEE Foundation, Incorporated, New York, NY for the benefit of the IEEE History Center (further designation can be made to a specific program, such as Oral Histories or Global History Network)."

Qualified under US Internal Revenue Code 501(c)(3), the IEEE Foundation is eligible to receive tax-deductible contributions in the United States. For other countries, please check with your local tax advisor regarding tax deductibility of charitable contributions. To learn more visit <http://www.ieeefoundation.org>.



Making a difference
is easier than you think.

IEEE History Center Fund

The IEEE History Center Fund is one of the 125+ funds administrated by the IEEE Foundation. It relies on charitable donations to sustain and expand its mission to preserve, research and promote the heritage of electrical and information technologies and sciences. Visit www.ieee.org/history_center

The IEEE Foundation provides resources to advance education, innovation and preservation. Together we can discover new solutions, recognize technology pioneers and honor the legacy of IEEE. Make a gift and show your commitment to technology and humanity. **Imagine the difference you can make.**

Donate today at www.ieeefoundation.org



IEEE History Center
Institute of Electrical and Electronics Engineers
445 Hoes Lane, P.O. Box 1331
Piscataway, NJ USA 08855-1331



Making a safe and secure
online gift to the
IEEE Foundation – History Center Fund
has never been easier!
Please register now by clicking
the “Donate Online” tab at
www.ieeefoundation.org