



# IEEE IEEE HISTORY CENTER

THE STATE UNIVERSITY OF NEW JERSEY  
**RUTGERS***Preserving, Researching, and Promoting the Legacy of Electrical Engineering and Computing*

## STATIC FROM THE DIRECTOR

**A**utumn always brings a great deal of activity to the IEEE History Center. Our Rutgers classes begin, and our new Rutgers Graduate Assistants arrive (see page 2). We participate in the IEEE membership renewal process. We prepare for meetings of the IEEE History Committee and Trustees of the IEEE History Center, as well as the IEEE Board of Directors. The Rutgers maintenance crew stores the salt for this corner of campus in our basement.

I am happy to be able to report, amidst the general flurry significant progress on two fronts: our programs, and our fundraising to support those programs. As many of our readers will know from the letter I sent out over the summer, the IEEE Virtual Museum project, first announced to the world in our last newsletter, is rapidly reaching its stride. We have hired a Project Manager, Ms. Kim Breit-

felder (see page 2), and engaged a partner, ScienCentral, Inc., of New York, award-winning producer of public-friendly technological content on radio, television, and the World Wide Web. If you haven't already, be sure to visit their Web site "Transistorized!" (<http://www.pbs.org/transistor/index.html>) A volunteer committee, chaired by IEEE Past President, IEEE History Committee Member, and Trustee of the IEEE History Center Ken Laker, has met and will be working with our staff on the Museum. Kim will be maintaining the page on the Web where you will be able to keep abreast of our progress and has, as her first act, shortened the URL where you find it: Check out (<http://www.ieee.org/museum>). I also encourage you to return frequently to our main Web page ([http://www.ieee.org/history\\_center](http://www.ieee.org/history_center)) to follow that and all our exciting programs.

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## FRIEND-TO-FRIEND HISTORY CHALLENGE

Paul Baran, Trustee of the IEEE History Center and long-time Friend, has pledged to match all donations to our Friends program for the next year, up to a total amount of \$100,000. This means that through September 2001, any gift to the IEEE History Center in the range of \$25 to \$2500 will be matched dollar for dollar. The early indications from responses to the summer appeal and from the beginnings of the IEEE renewal process are that the History Center's supporters are taking Paul's deed to heart, and we thank you. Please continue to bear in mind that, whether it comes in through our Web site, as a check-off donation on an IEEE membership renewal form, or through the final end-of-year opportunity to give we supply in this newsletter (see page 9), each gift will have double the impact during this special Challenge.

### IEEE HISTORY CENTER

## Issue 54 November 2000

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## Staff Activities

### Kim Breitfelder joins History Center to Manage Virtual Museum Project

Kim Breitfelder joined the IEEE History Center in July 2000 as the Project Manager of the IEEE Virtual Museum. Before coming to the History Center, Kim worked in IEEE Standards as a Senior Project Editor and then as a freelancer and consultant. She is currently in the process of completing an MA in History at the University of Pennsylvania.

### Max Likin is 2000 Intern

Max Likin, who majored in Modern European History and is working on his dissertation on Cecile Brunschvicq, Raymond Aaron and Rene Cassin in Twentieth Century France, is the History Center's intern for the year 2000. He and Director Michael Geselowitz are researching the technological German "brain drain" during the Nazi period, and the contributions those engineers fleeing from the Nazis made to the electrical and electronics industry in the United States. Max and Mike are working on a paper titled "Hitler's Exiles: Impact of German-speaking Engineers on the United States since the 1930s."

sertation on adolescent Jewish girls in America between 1860 and 1920. Electrical Engineering may be rather far afield from her interests in figure skating, music, and fantasy fiction, but she is looking forward to learning a great deal. **Joseph M. Gabriel**, who has a B.A. in Philosophy and an M.A. in History from the University of Massachusetts, Amherst. He is interested in U.S. social and political history, the history of medicine, the history of race, and global history. He is writing his dissertation on the origins of narcotic control before World War I. **Itsuki Kurashina**, who is studying US diplomatic history (not on US-Japanese relations). **Lisa Tarantino** who is writing her dissertation on American trade and immigration in the 1980s. **Curt Caldwell** who studies 20th century foreign relations and is writing his dissertation on the British Sterling-Dollar Crisis of 1949-1950 and the origins of NSC68.

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

Mailing address:  
Rutgers University  
39 Union Street  
New Brunswick, NJ USA 08901-8538  
Telephone: +1 732 932 1066  
Fax: +1 732 932 1193  
e-mail: [history@ieee.org](mailto:history@ieee.org)  
[http://www.ieee.org/history\\_center](http://www.ieee.org/history_center)

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2000

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IEEE History Center

Michael Geselowitz, *Director*  
[m.geselowitz@ieee.org](mailto:m.geselowitz@ieee.org)

Frederik Nebeker, *Senior Research Historian*  
[f.nebeker@ieee.org](mailto:f.nebeker@ieee.org)

David Morton, *Research Historian*  
[d.morton@ieee.org](mailto:d.morton@ieee.org)

David Hochfelder, *Post-doc*  
[hochfeld@rci.rutgers.edu](mailto:hochfeld@rci.rutgers.edu)

Mary Ann Hoffman, *Manager, Archival and Web Services*  
[m.a.hoffman@ieee.org](mailto:m.a.hoffman@ieee.org)

Kim Breitfelder, *Manager, Virtual Museum Project*  
[k.breitfelder@ieee.org](mailto:k.breitfelder@ieee.org)

Robert Colburn, *Research Coordinator*  
[r.colburn@ieee.org](mailto:r.colburn@ieee.org)

### 2000-2001 History Center GAs

This year's History Center graduate Assistants are the following: **Melissa Klapper**, who is completing her dis-

## Center Activities

### Milestones Update — Ireland and Japan

July 13 was unique in the 15-year history of the IEEE Milestones program: Two Milestones were dedicated on the same day on opposite sides of the globe! In demonstration of the continued growth of the program they were a world apart, one in Ireland sponsored by the IEEE UKRI Section of Region 8, the other in Japan sponsored by the IEEE Tokyo Section of Region 10. They also represented accomplishments that were more than 130 years old and concerned communications, and less than 40 years old and concerned transportation, respectively.

The older accomplishment was the laying of the transatlantic cable between Heart's Content, Newfoundland, Canada (already designated an IEEE Milestone) and County Kerry, Ireland. The Kerry plaque reads:

"On July 13, 1866 the Great Eastern steamed westward from Valentia, laying telegraph cable behind her. The successful landing at Heart's Content, Newfoundland on July 27 established a permanent electrical communications link that altered for all time personal, commercial and political relations between people across the Atlantic Ocean. Later, additional cables were laid from Valentia and new stations opened at Ballinskelligs (1874) and Waterville (1884), making County Kerry a major focal point for global communications."

IEEE President Dr. Bruce Eisenstein and Government of Ireland Minister John O'Donoghue TD were on hand to lead the honours, and they and a number of other dignitaries from IEEE, Canada, and Ireland made remarks. Wally Read, a past President of IEEE and a member of the IEEE History Committee, was also a participant and prepared an eyewitness account which can be found on our Web page at [http://www.ieee.org/organizations/history\\_center/milestones\\_photos/kerry.html](http://www.ieee.org/organizations/history_center/milestones_photos/kerry.html)

On the same day, in Nagoya, Japan in front of a crowd which included the American consul and other international dignitaries, representatives of the IEEE and the ASME jointly presented a bronze plaque designating the Tokaido Shinkansen (bullet train) as an electrical and mechanical engineering milestone. The IEEE Tokyo Section and Japan Railways hosted a spectacular reception to celebrate the 35th anniversary of the Shinkansen service. Many of the engineers who worked to design the Shinkansen were honored guests, and some of them recounted the adventures of the early design, development, and testing. The secret to the Shinkansen's success? Keeping the system as simple as possible.

The text of the plaque reads:

Tokaido Shinkansen (Bullet Train) was designed with the world's most advanced electrical and



*Very, Very Fast: The Newest Shinkansen 700 Series*

mechanical train technologies to operate at speeds up to 210 km/hr, a world record when it began service in 1964. It has carried over 100 million passengers per year for many years with an excellent safety record.

While honoring past achievements in high-speed rail travel, the ceremonies also showcased the newest advances — Japan Railways invited representatives of IEEE and ASME aboard the experimental magnetic levitation train, the MLX01, for a 450 kilometers per hour test run at the Yamanashi test facility. Propelled by superconducting magnets, the MLX01 levitates as it accelerates to a speed of approximately 160 km/hr, at which point the wheels retract and it is suspended 10 cm above the track. The ride is incredibly smooth and stable — you don't realize just how fast the train is moving...until you look out of the windows.

### **IEEE Broadcast Technology Society Exhibit**

On September 28th and 29th, 2000, the History Center was proud to participate in an exhibit commemorating more than fifty years of the IEEE Broadcast Technology Society. The BTS, which traces its ancestry back to the first IRE Professional Groups created in the 1940s, celebrated its 50th anniversary in 1999. That anniversary was marked by an exhibit at the IEEE Service Center in Piscataway. A portable version of the exhibit was designed by IEEE History Center staff members and delivered to the 50th Annual Broadcast Symposium, held at the Sheraton Premiere Hotel at Tysons Corner in Vienna, Virginia on September 28th and 29th, 2000. According to Noel Luddy of the BTS, the exhibit was "excellent and received a lot of attention during the Symposium."

### **New Ph.D. Program in the History of Technology, Environment, and Health**

The History Department at Rutgers, The State University of New Jersey, in association with the New Jersey Institute of Technology has announced a new Ph.D. program in the History of Technology, Environment, and Health, (HTEH) commencing in the autumn of 2001. This program will involve specialists in areas as diverse as urban history, public policy, human ecology, and anthropology, and will draw on faculty in global and comparative history. Students will also have the opportunity to participate in a two-year seminar (2001-2003) in Industrial Environments at the Rutgers Center for Historical Analysis.

The program will prepare students for academic careers and work in public history and in public policy research in the public and private sectors, archives, and museums. The IEEE History Center and the Institute for Health Care Policy and Aging Research are among several Rutgers institutes offering opportunities in policy research. The Thomas A. Edison Papers and the Rutgers Library Archives provide training in archives and scholarly editing. The extensive connections between scholars in HTEH and the museum world, as well as the Edison Papers' connections to the Edison National Historic Site, the Smithsonian Institution, and the Henry Ford Museum, provide opportunities for training in museum work. Applications: Office of Graduate and Professional Admissions, 18 Bishop Place, Rutgers, The State University of New Jersey, New Brunswick, NJ 08901(732 932 8231) [http://history.rutgers.edu/grad/app\\_info.html](http://history.rutgers.edu/grad/app_info.html)

### **SHOT and ICOHTEC Conferences**

The two most important annual conferences on the history of tech-

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Society for the History of Technology (SHOT) and the conference of the International Committee for the History of Technology (ICOHTEC). Since the vast majority of SHOT members live in North America, and most ICOHTEC members are Europeans, the conferences typically take place on different continents. This year, fortunately, Munich, Germany played host to SHOT just a few days before the ICOHTEC meeting in Prague, the Czech Republic.

Three historians from the IEEE History Center attended both conferences. Frederik Nebeker presented a paper on technological choice in military history, examining the case of ground telegraphy as a communica-

tions option in World War I. (Ground telegraphy, a technique of sending Morse code signals through the ground without wires, became important in the fighting on the Western Front because artillery constantly disrupted wired communications. The new availability of the electron tube as an amplifier gave this technique a much greater range than it otherwise had, but the electron tube also led to portable radio transceivers that soon proved more effective than ground telegraphy.) While in the Belfort area, Nebeker arranged a meeting with Robert Chapuis, historian of telephone switching, and Michel Simeon, conservator at both the Ampere Museum (near Lyon) and the Branly Museum (in Paris). David

Hochfelder attended sessions dealing with the history of computing and electrical communications. While Hochfelder was in Europe he visited the Danish Postal Museum, where he met with Jan Pedersen, a curator of their exhibits on telegraphy.

### Inez Hunt Papers

The research materials for the book *Lightning in His Hand: The Life Story of Nikola Tesla*, (1964 Sage Books), by Inez Hunt and Wanetta W. Draper have been donated to the Center by Fran Hunt Kiester, Ms. Hunt's daughter. The papers include research correspondence, notes, and collected newspaper and magazine articles about Nikola Tesla and his work.

## Things to See and Do

**TESLA, Master of Lightning**, premieres nationally on PBS on Tuesday, December 12, 2000, at 10:00 pm (check local listings). The program combines dramatizations with rare footage and photographs to weave a story filled with science, drama, and mystery. Included are many new and unknown details of Tesla's life. A great deal of the story is told in Tesla's own words, drawn from his autobiographical and scientific writings, and performed by **Stacy Keach**. For more information, visit the PBS website at: <http://www.pbs.org/tesla>

### 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 at a college or university of recognized standing, or up to one year of post-doctoral research for a scholar in this field who has received his Ph.D. within the past three years. The stipend is \$15,000. Candidates with undergraduate degrees in engineering, the sciences, or the humanities are eligible for the Fellowship. For pre-doctoral applicants, how-

ever, the award is conditional upon acceptance of the candidate into an appropriate graduate program in history at a school of recognized standing. In addition, pre-doctoral recipients may not hold or subsequently receive other fellowships, but they may earn up to \$5,000 for work that is directly related to their graduate studies. Pre-doctoral Fellows must pursue full-time graduate work and evidence of satisfactory academic performance is required. These restrictions do not apply to post-doctoral applicants. The Fellow is selected on the basis of the candidate's potential for pursuing research in and contributing to electrical history. For more information on this and other financial support provided to scholars, please see the IEEE History Center website at: [http://www.ieee.org/organizations/history\\_center/financial\\_support.html](http://www.ieee.org/organizations/history_center/financial_support.html) or write to: Chair, IEEE Fellowship in Electrical History Committee, Center for the History of Electrical Engineering, Rutgers—The State University of New Jersey, 39 Union Street, New Brunswick, NJ 08901-8538. The deadline for receipt of applications is 1 February. Applicants will be notified of the results by 15 April. The IEEE Fellowship in Electrical Engineer-

ing History is administered by the IEEE History Committee and supported by the IEEE Life Members Committee.

### IEEE History Center Internship—2001

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

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



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

The stipend paid to the intern is US\$3,500, but additional funds may be available to defray travel costs, depending on the intern's circumstances.

There is no formal application form. To apply, please mail a curriculum vitae showing your studies in electrical history along with a cover letter describing the sort of project you would be interested in doing. The deadline for contacting the IEEE History Center is 30 March 2001.

### **Post-Doctoral Fellowship in Electrical History—Academic Yr. 2001/2002 (NOTE: Pending final approval)**

The History Department and the IEEE History Center of Rutgers University announce a post-doctoral position for one year, renewable up to three additional years, in the history of electrical engineering and computing, beginning Fall 2001 (pending final approval).

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

Candidates must hold a Ph.D. in the history of technology or a related field, and must demonstrate the

potential to conduct professional-quality scholarship in the history of electrical or computer technologies, broadly defined. Teaching experience and a background in communicating with engineers or a non-academic audience are all desirable.

Applicants should submit a letter of interest, including a description of areas of research interest, curriculum vitae, writing sample (article or dissertation chapter), and three letters of recommendation. The deadline for completed applications is 30 April 2001

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

The IEEE History Center is cosponsored by the Institute of Electrical and Electronics Engineers, Inc. (IEEE)—the world's largest professional technical society—, and Rutgers—the State University of New Jersey. The mission of the Center is to preserve, research, and promote the legacy of electrical engineering and computing. The Center can be contacted at:

IEEE History Center  
Rutgers University  
39 Union Street  
New Brunswick, NJ 08901-8538  
email: [history@ieee.org](mailto:history@ieee.org)  
[http://www.ieee.org/history\\_center](http://www.ieee.org/history_center)

**National Air and Space Museum Fellowship Opportunities** in Aerospace History, 2001-2002. The National Air and Space Museum, Washington, DC provides three residential fellowships to support research in aerospace history. Stipends range from \$20,000 to \$45,000 per year, plus money for travel and miscellaneous expenses. Application deadline is 15 January, 2001, and successful applicants will be notified in mid-April. Further information may be found at: <http://www.nasm.edu/nasm/joinnasm/fellow/fellow.htm> In addition, the Museum offers the

Charles A. Lindberg Chair in Aerospace History. Senior scholars with distinguished records of publication who are working on, or anticipate working on, books in aerospace history, are invited to write letters of interest for academic year 2002-2003 or later. The Lindberg Chair is a one-year appointed position. Please contact: for topics in aviation, Dr. Peter L. Jakab, Aeronautics Division, National Air and Space Museum, Smithsonian Institution, Washington, DC 20560-0312, or for space history topics: Dr. Michael J. Neufeld, Space History Division, National Air and Space Museum, Smithsonian Institution, Washington, DC 20560-0311

### **Bakken Visiting Research Fellowships**

The Bakken Library and Museum in Minneapolis offers visiting research fellowships for the purpose of facilitating scholarly research in its collection of books, journals, manuscripts, prints, and instruments. The focus of the Bakken's collection is on the history of electricity and magnetism and their applications in the life sciences and medicine. Related materials include mesmerism and animal magnetism, 19th-century ephemera concerning alternative electromedical therapies, letters of various scientists, and trade catalogues. The instruments include electrostatic generators, magneto-electric generators, induction coils, physiological instruments, recording devices, and accessories.

The fellowship is a maximum of \$1,300 and is to be used to help defray the expenses of travel, subsistence, and other direct costs of conducting research at The Bakken. The minimum period of residence is one week. **The next deadline is February 1, 2001.** For further details contact: David J. Rhees, Executive Director, The Bakken Library and Museum, 3537 Zenith Avenue South, Minneapolis, MN 55416, USA (telephone: 612-926-3878, extension 213; fax: 612-927-7265; e-mail: [rhees@thebakken.org](mailto:rhees@thebakken.org); <http://www.thebakken.org>)

## SURF CITY

**Mystery Photo Challenge:** The IEEE History Center maintains a photographic archive of more than 2,800 images. From time to time images are donated without any identification. Can you help identify pictures? We are looking for the description, year, manufacturer, purpose of equipment, etc. We now have a web page that features one photograph per month. You can e-mail us your answer at *history@ieee.org* or you can fill out an on-line form! [http://www.ieee.org/organizations/history\\_center/mystery.html](http://www.ieee.org/organizations/history_center/mystery.html)



**Edison Memorial Tower and Menlo Park Museum:** A little (and

little known) museum, just a stone's throw from the IEEE History Center features the work of the of the most prolific inventors in history, Thomas Edison. Work on more than 400 patents was accomplished in his Menlo Park Laboratory from 1876 to 1883. The web site highlights this work. New projects under way at the museum include expansion of the Historic Recording Project. The Museum invites famous personalities to record their voice using original Edison equipment. Among those who have participated are: Buzz Aldrin, Ed Koch, and Walter Cronkite. <http://www.edisonnj.org/menlopark/>

**New Oral Histories on the Web:** The History Center actively gathers

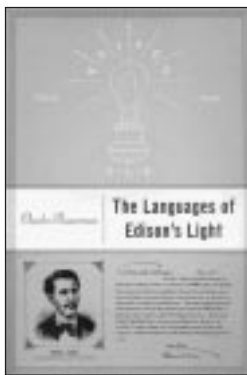
Oral Histories from the leading electrical engineers of the 20th Century. To date, the History Center has conducted over 400 Oral Histories; with the addition of 50 new histories, there are now over 175 of which are available on our web site. Here is a sampling of the new Histories: Vint Cerf, Thelma Estrin, Robert W. Galvin, Edwin L. Harder, Brad Parkinson, Simon Ramo, Herman Schwan, and Konrad Zuse. A list of the new Oral Histories can be located at [http://www.ieee.org/organizations/history\\_center/oral\\_histories/new\\_oh.html](http://www.ieee.org/organizations/history_center/oral_histories/new_oh.html)

**Deutsches Museum:** The Deutsches Museum, founded in 1906, is one of the largest museums of technology and science in the world. Its web site focuses on the Museum and its exhibits. There are several interactive demonstrations on-line which are very well done! Definitely worth a visit (right Hal?) [http://www.deutsches-museum.de/e\\_index.htm](http://www.deutsches-museum.de/e_index.htm)

## Bibliography

BAZERMAN, CHARLES, *The Languages of Edison's Light*, MIT Press, Cambridge, 1999.

Thomas Edison was the most influential technologist in American history, and his inventions reshaped his society and culture in dramatic ways. He remains today a potent cultural symbol of the self-made heroic democratic inventor. While many historians have documented Edison's work on electrification and have examined the ways in which it reshaped American life, Charles Bazerman gives us a unique view



of Edison as an inventor and challenges us to rethink our conceptions about the nature of invention. Bazerman's main argument is that Edison's engagement with and manipulation of existing cultural forms were integral parts of his invention and marketing of electrical lighting around 1880. In short, electrical lighting could not succeed without its inventor giving it "meaning and value" (p. 2). Bazerman specifically examines Edison's skillful manipulation of the press, calling him "the perfect media star of his era of democratic progress" (p. 36); his connections to the New York

financial world; his skillful navigation of the patent system, which he used "to create a thicket of representations" (p. 90) to surround and protect his system; his marketing strategies to generate demand for electrification; his frequent public demonstrations; and his dealings with urban politicians. Through a skillful and exhaustive reading of Edison's papers, Bazerman shows that cultural processes and rhetorical strategies were integral parts of technological innovation itself.

Available from the MIT Press, Cambridge, MA, 800-358-0343, fax 617-625-6660, <http://mitpress.mit.edu>, \$39.50 hardcover, ISBN 0-262-02456-X, 409 pp., index.

COOPER, GAIL, *Air-Conditioning America: Engineers and the Controlled Environment, 1900-1960*. Johns Hopkins University Press, Baltimore, 1998.

Lee Kuan Yew, long-time leader of Singapore, called air conditioning the greatest invention of all time. It certainly has contributed greatly to the present prosperity of that nation, which is just 80 miles north of the equator. Gail Cooper has written the story of air-conditioning from the turn of the century, when certain inventors and businessmen conceived of controlling the indoor climate, to 1960, when the technology was in widespread use in many countries. It is a scholarly book, with sources given in endnotes, that tells the story not only of technology itself, but also of business practices, economics, ideologies, and consumer preferences.



Readers learn about pioneers of air conditioning—notably Alfred Wolff, Stuart Cramer, and Willis Carrier—and about the establishment of a research laboratory for heating and ventilation, sponsored by the American Society of Heating and Ventilating Engineers, in 1919 at the U.S. Bureau of Mines in Pittsburgh. (This laboratory did important work in developing accurate and practical instruments and in determining numerical values for the commonly used constants.) Cooper presents the interesting story of the role of motion-picture theaters in the emergence of comfort air-conditioning. (In 1938 some 15,000 of the 16,251 cinemas in the United States were equipped with air conditioning; bowling alleys, hotels, and department stores were other places one might experience air-conditioning.) A principal subject is the cultivation of a market for home air-conditioning, which suc-

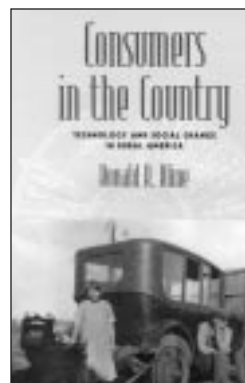
ceeded more rapidly through window air-conditioners than through central air-conditioning. (It was mainly in the 1950s that air-conditioning became common in homes: sales of room air-conditioners climbed from 1000 units in 1945 to 193,000 in 1950 to 1.3 million in 1956.)

The author points out that there was considerable resistance, on the part of consumers, to the future imagined by air-conditioning engineers of man-made weather: many people liked the traditional hot-weather culture—clothes, food, drink, and entertainment appropriate to the climate—and there was widespread opposition to keeping windows closed.

Available from Johns Hopkins University Press, Baltimore. \$35.00 cloth, ISBN 0-8018-5716-3, x + 229 pp., index.

KLINE, RONALD, *Consumers in the Country: Technology and Social Change in Rural America* (Baltimore: Johns Hopkins, 2000)

Ronald Kline, IEEE Member and senior volunteer for the IEEE Society for the Social Implications of Technology, is also an associate professor of the history of technology at Cornell. His well-received biography *Steinmetz: Engineer and Socialist*, was reviewed in these pages several years ago. Now Kline has developed a study of the ways that ordinary people adopted such technologies as the telephone, automobile, the radio, and electric lighting between about 1900 and 1960. As the author points out, these technologies have been commonly thought of as bringing urban modernity to the



country. He demonstrates that while rural life was genuinely transformed, this revolution was not as straightforward as we might have thought. Rather than simply adopting urban ways along with urban technologies, country folk adapted the new technology to their own needs, molding it to fit evolving rural social structures and mores. The results, Kline demonstrates, were “novel ways of life, ones that lay between rural culture and suburban consumerism.”

Available from the Johns Hopkins University Press, Baltimore, MD, (410) 516-6900, fax: (410) 516-6968, <http://www.press.jhu.edu/press>, \$39.95, paper, ISBN 0-8018-6248-5, 362 pp, index

LEVIN, MIRIAM R., editor, *Cultures of Control*, Harwood Academic Publishers, 2000

This book, Volume 9 in the series *Studies in the History of Science, Technology and Medicine*, edited by John Krige, deals with the history of communication and control. As the volume editor, Miriam R. Levin of Case Western Reserve indicates in her Preface, the work done in this important area has been relatively thin and scattered. A number of events propelled her to try to assemble several papers on the topic of the history of control as a cultural phenomenon by well known historians of technology in a single volume. She invited noted scholar and past member of the IEEE

History Committee Thomas P. Hughes to pen an introduction giving the issue historical perspective, while she wrote a theoretical treatment in the first chapter. The chapters then present a series of case studies, all involving the West since

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## Bibliography

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the Industrial Revolution, but ranging in scope from French textile measurement to Nazi use of statistics in running concentration camps, to Disney's construction from scratch of a new American town.

Chapters of particular interest to readers of this newsletter include: Dennis Bayart on the application of statistics to quality control, using the example of the carbon microphone; IEEE History Committee member David Mindell on stability, using as examples the Sperry Gyroscope, U.S. Navy fire control systems, Black's invention of negative feedback, and Bush's Differential Analyzer; and Slava Gerovitch on Soviet cybernetics.

The contributions tend to be written in an academic style, while at the same time, because of the cultural approach, being light on technological details, but on the whole the editor has done a great service in bringing these papers together. As she says in her Preface, "If the history of the culture of control has yet to be written, there is a foundation on which to build." This volume is meant to be that foundation, and readers with an interest in the history of control may wish to examine it.

Available from: OPA N.V., Amsteldijk 166, 1079 LH Amsterdam, The Netherlands, [http:// www.gbhap.com/](http://www.gbhap.com/), \$24, paper, ISBN 90-5823-013-9, xxix + 274 pp., index.

MCCLELLAN, JAMES E., III and HAROLD DORN, *Science and Technology in World History: An Introduc-*



tion, Johns Hopkins, Baltimore, 1999.

McClellan and Dorn of Stevens Institute of Technology wrote this textbook based on practical teaching experience, drawing on "the hard knocks of the classroom," to determine "the essential lessons and what materials and examples work well in conveying those lessons." Innovative in its effort to consolidate the history of technology and the history of science (two academic fields which have remained remarkably separate over the years) into a single volume, the authors are at pains not to slight either subject. Another distinguishing feature of this work, at least from the standpoint of the history of technology, is

that it draws heavily on anthropological literature to extend the story of technological development back to the origins of human existence. Given the extremely broad coverage of human history, it is not surprising that only a quarter of the book treats the period since the 18th century, despite the fact that this is precisely the starting point for most histories of science and technology. For this reason, educators searching for a replacement for existing textbooks may it necessary to redesign their courses in order to make full use of this well-researched and carefully crafted volume.

Available from the Johns Hopkins University Press, Baltimore, MD, (410) 516-6900, fax: (410) 516-6968, <http://www.press.jhu.edu/press>, \$18.95, paper, ISBN 0-8018-5868-2, 0-8018-5869-0 (pb), 373pp, index

ROJAS, RAÚL, AND ULF HASHA-

GEN, eds. *The First Computers: History and Architectures*. MIT Press, 2000.

This book, containing 24 contributions by 27 scholars, presents a wide variety of studies on early computers, most of them concerned with computer architecture. The book consists of five parts. The first contains an account of the emergence of the discipline of computer science, a discussion of the value of historical reconstructions, a taxonomy of early computers, and an explanation of the constraints imposed by available materials on early computer designers. The second part deals with early computers in the United States, including the Atanasoff-Berry computer, Howard Aiken's computers, the ENIAC, and the Institute for Advanced Study computer. The third part, consisting of seven studies, concerns early German computers. In the fourth part are five studies of early British computers, and the fifth part consists of two papers on early Japanese computers.

This book is notable for providing a great deal of technical information previously unavailable, for presenting the developments in four different countries, and for revealing the wide range of choices open to early computer designers. An argument made by the editors for considering in detail the architectures of early computers is that current workers in the field can derive practical benefit from history, since the changes in hardware constraints over time change the relative advantages of different architectures. A structure that was superseded decades ago might once again become the most efficient.

Available from MIT Press, Cambridge, MA, 800 358-0343, fax 617



625-6660, <http://mitpress.mit.edu>, \$39.95, hardback, ISBN 0-262-28197-5, xii + 457 pp., index.

SIDDIQI, ASIF A., *Challenge to Apollo: The Soviet Union and the Space Race 1945-1974*, National Aeronautics and Space Administration, Washington, 2000.

Siddiqi's book is a must-read for anyone interested in the history of rocketry and space exploration, as well as for anyone interested in the workings of Soviet technology. Using material from the recently-opened archives, Siddiqi gives us a detailed look at the development of the Soviet space program from the amateur rocket groups which flourished in the twenties to the massive state-run operation of the 1960s and 1970s. From letters, diary entries, photographs, transcripts of the dialogue between the cosmonauts and the ground controllers, and frames from launch footage, Siddiqi takes us

behind the hitherto closed doors of the design and manufacturing teams who built the early engines, as well as to the launches themselves. The triumph of Sputnik, the tension leading up to Gagarin's flight, the horror of the Soyuz I crash which killed Vladimir Komarov, and the R-16 explosion which killed 127 technicians on the ground, are all described with a strong sense of immediacy. We sense the political pressure being exerted on the designers, often to the detriment of safety and sound engineering, to launch certain missions for reasons of international prestige.

Siddiqi gives us an intimate portrait not only of the machinery and technology, but also of the men and women who designed, built, and flew it. We see Gagarin change from the good-humored, affable cosmo-



naut he was prior to his flight as he succumbs to the pressures of fame, sinking into alcoholic excess, then restoring himself to flying sharpness, only to be killed in a training flight attempting to avoid a MIG-21 which had strayed into a restricted area.

Extensively indexed, and with more than 100 pages of tables, *Challenge to Apollo* is much more than the Soviet version of *The Right Stuff* (and every bit as thrilling to read). It is the extensive history of a large space program with its successes, failures and personalities.

Available from: National Aeronautics and Space Administration, NASA History Division, Office of Policy and Plans, Washington, DC, NASA SP-2000-4408, 1011 pp., index, illust.

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## ELECTRICAL TECHNOLOGIES IN THE MOVIES: AUTOMATIC DOORS

An automatic door—that is, a door which opens and closes by itself—requires both a source of mechanical power and a control system. An electric motor usually provides the power. The control system may be fairly simple, involving only mechanical switches, or highly sophisticated, involving, for example, remote triggering by radio waves and sensors such as an electric eye or a touch sensor. By the mid 1930s there were automatic doors in ships, elevators, restaurants, and other places, some of them incorporating electric eyes.

The history of automatic doors can be illustrated by movies. Consider the 1954 movie “Sabrina”, starring Humphrey Bogart and Audrey Hep-

burn. Here, as often, automatic doors are a sign of affluence. The multiple garages of the Larrabee estate on Long Island have automatic doors, and Linus Larabee’s office in the city is entered through a remote-controlled sliding door. A few years later the French film-maker Jacques Tati made fun of the technology in “Mon oncle” (1958): there is a remote-controlled gate to a family’s yard; there are automatic doors on cabinets in the ultra-modern kitchen; and there is a garage door triggered by interrupting a beam of light across the driveway. These doors seem often not to function as intended, and a maid is terrified of triggering the garage door, thinking she will be electrocuted.

Automatic sliding doors appear fre-

quently in movies. In the James Bond movie “The Living Daylights” (1987) a secret agent has that crushed out of him by a sliding door. The remotely operated sliding doors in an office building in “Rising Sun” (1993) suggest control by the corporation. In “Kolya” (1996) automatic sliding doors at a crematory are shown several times and are recalled at the end of the movie by automatic doors at an airport. The 1998 movie “Sliding Doors”, starring Gwyneth Paltrow, makes the automatic sliding doors of subway cars, elevators, and office buildings the main image of the movie.

In Gremlins 2 (1990) the little mon-

*continued on page 12*

### Static from the Director:

*continued from page 1*

As you will see from that Web page and from this newsletter, not all of our activity has been on the IEEE Virtual Museum front. The Milestones program, for example, is still going strong (see page 2), and the Center has even received a grant from the National Conference of State Historic Preservation Officers to work with the United States National Historic Landmark Survey to identify American sites from the history of wireless communications that might be eligible simultaneously for U.S. Landmark designation and IEEE Milestone status. Our work with IEEE Technical Societies to help them commemorate the history of their technologies and their organizations also continues, as evidenced by the small exhibit we prepared for the IEEE Broadcast Technology Society (see page 3).

How will we pay for the IEEE Virtual Museum and the other programs highlighted on our Web pages and

in this newsletter issue? With grants from the IEEE Foundation General Fund and the IEEE Life Members Committee, for one thing. However, despite these and external grants like the Historic Preservation one mentioned above, and despite a growing endowment (see below), we still depend primarily on you, the individual donor, to support our activities. Therefore, we are thrilled to announce our first ever special campaign aimed directly at you, our grass-root supporter, the “Friend-to-Friend History Challenge.” Paul Baran, Trustee of the IEEE History Center and long-time Friend, has pledged to match all donations to our Friends program for the next year, up to a total amount of \$100,000, and early indications are that this will spur increased annual giving to the Center (see box on page 1).

As mentioned, another source of funds for us to carry out our mis-

sion is our endowment, and we are happy to report that the campaign to increase our endowment by soliciting IEEE Technical Societies continues to bear fruit—since the last newsletter the IEEE Communications Society contributed \$130,000 in response to the IEEE Foundation Million Dollar Challenge! In addition, long-time Friend of the Center IEEE Life Fellow Harold W. Lord has decided to give an unprecedented individual gift of over \$100,000 in stock to our Partnership Program, which is slated for our endowment. All contributions great and small will of course be honored in our next newsletter in March, when we traditionally publish our honor roll of donors.

Thank you all again for your interest in and support of our efforts to preserve, research, and promote the legacy of electrical engineering and computing. Best wishes for a happy holiday season.



## Electrical Technologies

*continued from page 11*

sters take over a high-tech corporate skyscraper, and the automatic doors go wildly out of control. The automatic doors on the cages of experimental animals in “Nutty Professor” (1996) are the cause of mishap. In “Singles” (1992) a woman regrets having given a garage-door opener as a sign of trust. In “Scream” (1996) a woman is intentionally killed when a garage door is opened while she is trying to crawl through a pet door. In “L.A. Confidential” (1997), set in the 1950s, a millionaire makes ostentatious use of a garage door opener. And remote control is parodied in “Robin Hood: Men in Tights” (1993), where Prince John clicks to close a portcullis.

The Star Trek television series, which began in 1966, showed futuristic sliding doors that automatically receded into the wall as a person walked through. The doors were actually operated by

prop men, and there is a well-known, and hilarious, collection of outtakes showing actors walking into them when they failed to retract.

We would be grateful for reports from readers of this newsletter who know of interesting depictions of automatic doors in movies. You may contact us at [history@ieee.org](mailto:history@ieee.org).

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