

IEEE History Center

ISSUE 66, November 2004

Static from the Director1

Center Activities2
 Virtual Museum
 Staff Notes
 Marconi Project
 Bletchley Park Conference

Things to See and Do5
 Surf City
 Bakken Library
 Mystery Photo

EE in the Movies6

Bibliography8

Programs of Financial Support . . .10

Obituaries12

STATIC FROM THE DIRECTOR



Attendees of the 2004 History of Electronics Conference at Bletchley Park

Last issue I promised a report from our conference and related activities in the United Kingdom. Unfortunately, a personal situation meant that at the last minute I could not go. However, as you will see throughout this issue, thanks to the team here at the IEEE History Center, the event was an overwhelming success. Without repeating the details elsewhere in this issue, let me say that the activities showed the range of contributions that a History Center can provide for IEEE.

The conference at Bletchley Park (site of the British codebreaking successes of World War II) brought together engineers and historians, professionals and hobbyists, young and old from around the world to explore and share appreciation of technological heritage. The Milestone dedication for the Fleming Valve brought a great deal of positive publicity to the IEEE UKRI Section. The staff of the History Center and the volunteers of the IEEE History Committee and the IEEE UKRI Section worked closely with the IEE and the IEE Japan, among other sister organizations, to explore how we can

work globally to preserve the legacy of our technologies and to promote their importance to public, attacking the twin problems of technological illiteracy and of attracting new talent to our fields.

I should point out that, despite the focus on the UK activities, our other programs continue to flourish. Including the Fleming Valve festivities, there have been seven Milestone dedications this year—a record! This issue features still more kudos for the IEEE Virtual Museum. Our oral history collection continues to grow—next year we will be working with the IEEE Electromagnetic Compatibility Society to enhance our holdings in their technological area. In our next issue we will also be able to report on the completion of our Eta Kappa Nu project.

All of these great programs could not be carried out, however, without you, our supporters. Because this is the time of year—between the IEEE renewal cycle and end-of-year philanthropic giving—when we receive the bulk of

continued on page 2

CENTER ACTIVITIES

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

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STATIC FROM THE DIRECTOR *continued from cover page*

our private donations, let me thank you in advance for being a part of our worthy efforts to preserve, research, and promote the legacy of electrical engineering and computing. Best wishes for a happy and healthy holiday season and new year to you and yours.

IEEE VIRTUAL MUSEUM LAUDED BY SCIENTIFIC AMERICAN AND HARVARD BUSINESS SCHOOL

The IEEE Virtual Museum continues to gather applause from some very prestigious publications. In October, *Scientific American* listed the VM as a winner of its 2004 Science and Technology Web Awards, citing it as: "Far more exciting than it sounds, the Museum of the Institute of Electrical and Electronics Engineers is a beautifully designed website featuring a cornucopia of exhibits encompassing topics as wide-ranging as microelectronics; women and technology; and microwaves. You'll need Flash and Quicktime to view all the extras buried in these online presentations. The IEEE truly does 'socket to you' by suggesting that without their work, you'd be living in a world not only without TV, telephones, computers, X-rays and the like, but, when you get right down to it, pretty much every modern convenience you can think of. Start digging—you'll be just as grateful as the Institute expects you to be!"

Harvard Business School's *Working Knowledge* also praised the Virtual Museum, writing: "We're suckers for good museums about technology...this collection focusing on technology developments around electricity is fun and informative. Exhibits include: "How Electricity Came to Be"; "Let's Get Small: The Shrinking World of Microelectronics"; "Powering the Electrical Revolution: Women and Technology"; "The Beat Goes On: How Sounds are Recorded and Played"; and "World War II: How War Impacted Technology, How Technology Impacted War." This site was developed by the Institute of Electrical and Electronics Engineers, better known as the IEEE."

THE IEEE HISTORY CENTER NEWSLETTER ADVERTISING RATES

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

	<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 ieee-history@ieee.org. Deadlines for receipt of ad copy are 2 February, 2 June, 2 October. For more information, contact Robert Colburn at r.colburn@ieee.org.

STAFF NOTES

2004-2005 History Center GAs

Charles Foy is a doctoral candidate in Early American History. His dissertation, "Ports of Slavery, Ports of Freedom," examines the ways that slaves in 18th century northern port cities utilized the maritime industry and imperial conflicts to obtain freedom. His article "Seas of Freedom" concerning slave mariners in 18th century New York City was published in the Winter/Spring 2004 edition of *Seaport* magazine.

Sandra Mendiola is a Ph.D. student in the Rutgers History Department. She was born and raised in Puebla, Mexico where she got her B.A in International Relations at the UDLA. She completed her M.A in History at the University of Toronto. Her major field is Latin America and her minor field is Gender History. Her research focuses on female workers in the food industry during the 20th century. She wants to incorporate into her work the role that businesswomen played in the Mexican economy. Although Sandra misses her hometown, she enjoys academic life in North America and the wonderful people that she has met who made her feel at home. This past summer, she got married in Puebla.

Tracy Eddy is returning for a third year as a GA at the History Center. Tracy is a Rutgers alumna and is ABD in the Rutgers History Department graduate program. Her research interests focus on 20th century American political history, and her dissertation examines H.R. Haldeman's role in the Nixon White House. Her minor field is the history of technology and the environment. During her past two years at the Center, Tracy has written articles about topics in the history of electricity, for example "Electronics in the Olympics," as well as assisting in Center projects such as the Marconi Foundation project described below.

The IEEE History Center welcomes back **Damien Miller**, who was a GA in 2001-002, and also welcomes **David Teklits** as a new GA

IEEE History Staffer Robert Colburn Given Try-out for US National Rowing Team

IEEE staffer Robert Colburn was chosen to cox one of the boats (heavyweight coxed pair) competing this summer at US Rowing Trials for the right to represent the United States at the World Rowing Championships on Lake Banyoles in Spain where the 1992 Olympics were held. Although Robert's boat did not qualify to go to Worlds -- that coveted honor went to his teammates at the Penn Athletic Club Rowing Association, (Vince Puma, Dana Schmunk, and Chris DeFelice) -- the opportunity to train and compete with athletes at the elite level of the sport was an

unforgettable experience.

Robert went on to be part of the PennAC team which won the US National Rowing Regatta in Indianapolis this summer, and also filled in as a spare practice coxswain for the US coxed pair which did go to Spain and which eventually finished 8th in the world.



Micah Boyd, Patrick Godfrey and Robert Colburn at US National Team Trials, (copyright Row2k.com)

THE MARCONI FOUNDATION

Thirty Years of Telecommunications Excellence: IEEE History Center Collaborates with Marconi Foundation

The Guglielmo Marconi International Fellowship Foundation celebrates its 30th anniversary in 2004. Located at Columbia University, the Foundation was established by the daughter of radio pioneer (and IRE member) Guglielmo Marconi to commemorate her father's achievements in telecommunications as well as to honor outstanding achievements by others in that field. The Marconi Fellowship is a prestigious award and is considered the top honor in the field of telecommunications.

As part of the celebration, the Marconi Foundation awarded a grant to the IEEE History Center to research and write a book on the history of telecommunications since Marconi, focusing on the achievements and breakthroughs of the Marconi Fellows. By the time you read this, the book (which has been translated into Italian) will have been released in Bologna, Italy on 8 October at the dinner honoring this year's Fellows.

continued on page 7

HISTORY CENTER CONFERENCE AT BLETCHLEY PARK

The 2004 IEEE Conference on the History of Electronics (CHE2004) was the sixth in a series of workshops sponsored by the IEEE History Committee and the IEEE History Center at Rutgers University. It celebrated the centennial of the invention of the Fleming diode, which was the first of the radio tubes. The conference was held from Monday 28 June through Wednesday 30 June at the historic Bletchley Park in the United Kingdom, which was an ideal setting with conference facilities in the Victorian mansion and historical exhibits there and elsewhere in the park-like grounds.

The program, presented in two parallel sessions for most of the conference, included 45 lectures, a poster session, and a panel discussion. On the first two days of the conference there were historical tours of the Bletchley Park site; two highlights of these tours were the reconstructed (electronic) Colossus computer and the reconstructed (electromechanical) Bombe computer.

Almost 100 people, from 18 countries on five continents, attended the conference. The topics of the sessions were: electronic music, the beginnings of electronics, solid-state electronics, medical and measuring instruments, electron tubes, analog and digital electronics, communications electronics, television, power electronics, space communications, new concepts in the electronic age, business and government contexts, electronics in national contexts, and electronics and user groups.

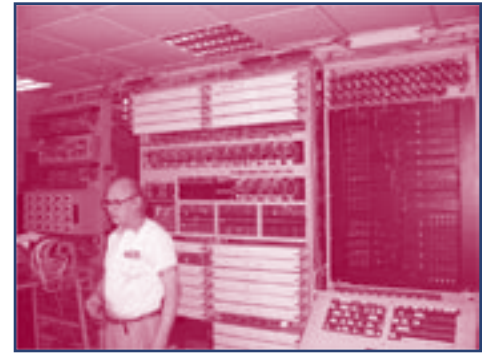
At the opening plenary session, Peter Merriman provided a welcome by describing some of work done at Bletchley Park during World War II, and the computer pioneer Sir Maurice Wilkes gave the opening address on the origins of electronic engineering. The poster session presented the research of nine winners of the historical paper competition, a worldwide contest among IEEE Student Members sponsored

by the IEEE Foundation [see bottom of page] The panel discussion, by Frank Land, John Aris, Martin Campbell-Kelly, Sir Anthony Cleaver, and Michael Forrest, concerned the history of the

computer business. Concluding the conference was an Awards Luncheon, where Bernard Finn talked about the artifacts of electronics history and IEEE President Arthur Winston presented the prizes in the historical paper contest.

The conference Website, www.ieee.org/organizations/history_center/Che2004/index.html, provides much information about the conference: the full program, a collection of photographs, 38 papers that were presented at the conference, and more.

The same week, there were several other events relating to the history of electronics. On the day following the conference, there was a dedication of an IEEE Milestone at University College in London. The event, attended by about 200 people, included lectures by Sungook Hong (on "John Ambrose Fleming: From power to 'ether' engineering") and Eric Ash (on "How to save the planet"), the unveiling of the plaque, and a garden reception. There was a combined IEE/University College conference on the legacy of John Ambrose Fleming, held at University College. And there was the so-called "Maui III Meeting" of representatives from the IEEJ (the Institute of Electrical Engineers of Japan), the IEEE, and the IEE to discuss the promotion of the history of electrical engineering.



Conference attendees tour code-breaking equipment at Bletchley Park

FOUNDATION SPONSORS A HISTORY PAPER COMPETITION FOR IEEE STUDENT MEMBERS

The 2004 IEEE Conference on the History of Electronics marked the one hundredth anniversary of the invention by John Ambrose Fleming of the diode electron-tube, the first of the radio tubes. The conference took place in late June in England Bletchley Park, the center of British codebreaking during World War II. Over the three days of the conference, four dozen papers were presented to some 100 attendees from 20 countries. A valuable part of the conference was the participation, in the form of a poster session and oral presentations, of nine IEEE Student Members from around the world.

SURF CITY

Computer Collector

Computer Collector was founded in 2002 to cover the growing hobby of collecting old computers. Run by Evan Koblentz, formerly of *eWeek*, *Computer Collector* publishes articles and columns from hobby experts, experienced journalists, and industry luminaries, as buy/sell/trade advertisements. Although anyone can visit the site, it is billed as an e-mail magazine. Subscribing, which is free and guarantees privacy (you can subscribe easily on the site), gets you a weekly update and access to members-only areas of the site. With more than 500 subscribers and growing, this is an important gateway to an important new group of people interested in helping to preserve—in their own hobbyist way—the history of electrical engineering and computing.

<http://www.snarc.net/ccen.html>

E-Merit Badges

Under the leadership of Senior Member Ralph W. Russell II, IEEE has embarked on a new project called **emeritbadges.org**. Its mission is to provide a global non-discriminatory pre-college education program for boys and girls. The program is built on an existing 23 year old program with the Boy Scouts of America concerning technology merit badges, but the plan now is to globalize and develop a program for girls as well. The first step was the establishment of a Web site, which is still a work in progress, but which we urge you to visit and provide feedback.

<http://www.emeritbadges.org>

BAKKEN LIBRARY AND MUSEUM FELLOWSHIPS AND GRANTS

Each year, the Bakken Library and Museum in Minneapolis offers Visiting Research Fellowships and Research Travel Grants to facilitate research in its collection of books, journals, manuscripts, and instruments. The subject of the Bakken's collections is the history of electricity and magnetism with a focus on their roles in the life sciences and medicine. Significant holdings include the works of natural philosophers, scientists, physicians, electro-therapists, and electrophysiologists of the 18th, 19th, and early 20th centuries.

Visiting Research Fellowships up to a maximum of \$1,500 are to help defray the expenses of travel, subsistence, and other direct costs of conducting research at The Bakken. The minimum period of residence is two weeks. Preference is given to researchers who are interested in collaborating with The Bakken on exhibits or other programs. The deadline for applications is 15 February 2005.

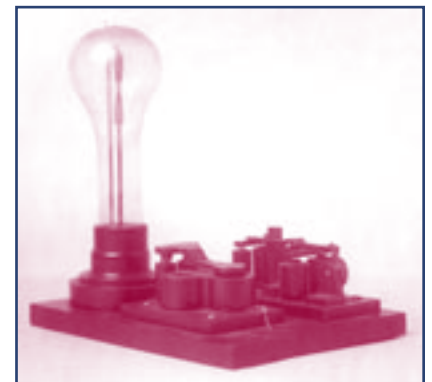
Travel Grants up to a maximum of \$500 (U.S.) and \$750 (non-US) are awarded to help defray the expenses of travel, subsistence, and other direct costs of conducting research at The Bakken. The minimum period of residence is one week. Application may be made at any time during the calendar year. For application guidelines or further information, please contact: Elizabeth Ihrig, Librarian, The Bakken Library and Museum, 3537 Zenith Avenue So., Minneapolis, MN., 55416, tel 612-926-3878 ext. 227; fax (612) 927-7265; Ihrig@thebakken.org

MYSTERY PHOTO CHALLENGE

Mystery Photograph #16

The IEEE History Center maintains a photographic archive of more than 4,300 images. From time to time images are donated without any identification. Can you help identify this photograph? We are interested in any details such as type of equipment, approximate dates, manufacturer, how/where used, and anything else of historical interest you would like to tell us.

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



AMUSEMENT PARKS

Amusement parks make great use of electricity. Indeed, it was specifically for the purpose of using electricity that many of the first amusement parks in the United States were built. The electric-streetcar companies saw them as a way of using the excess generating capacity that the companies had in the evenings and on the weekends. (The companies almost always generated their own electricity.) By building an amusement park at the end of line, where real estate was least expensive, the companies not only found a use for the available electricity but also created business for the streetcars during slack periods. These amusement parks, often called trolley parks, sprang up in U.S. cities in the late 1880s and over the next two decades. There were, of course, electrically powered rides, such as carousels and Ferris wheels, and the spectacular lighting of these parks was a principal attraction as well.

Not surprisingly, amusement parks have been a favorite setting for filmmaking. A very early movie is "Coney Island" (1917), with some of the greatest stars of the silent-film era, including Buster Keaton, Fatty Arbuckle, and the Keystone Kops. Coney Island's Luna Park had opened in 1903, and it boasted 250,000 electric lights. In the century since then, Coney Island has appeared in numerous movies, such as "Coney Island" (1943), "Carnival of Blood" (1970), "The Wiz" (1978), and "He Got Game" (1998). In "Annie Hall" (1977) the neurotic Alvy Singer (Woody Allen) returns to his boyhood home in Coney Island. His father ran

the bumper-car ride, and the family house was directly underneath the roller coaster (suggesting one source of Alvy's neurosis).

For filmmakers, amusement parks usually connoted joie de vivre. The 1927 movie "It", which made Clara Bow famous and gave her the nickname "The It Girl", features the lights of an amusement park and a fun house there. In amusement parks, lovers enjoy each other's company, and pursue each other, as in the recent "Amélie" ("Le fabuleux destin d'Amélie Poulain").

Yet the amusement park, though designed as a place of pleasure, can easily be a chilling, even a frightening place, particularly when it is deserted. Orson Welles made famous use of this in "The Lady from Shanghai" (1948), with its chase through an empty amusement park culminating in a shoot-out in the hall of mirrors, and in "The Third Man" (1949), with Harry Lime's rendezvous at Vienna's giant Ferris wheel when there is no one in the area. That same Ferris wheel, incidentally, appears almost forty years later in the James Bond movie "The Living Daylights" (1987), and a British agent is killed nearby. The final, terror-fraught scene of "Charlie Chan in the Chinese Cat" (1944) occurs in a seemingly deserted fun house. Alfred Hitchcock, in "Strangers on a Train" (1951), managed to give an amusement park, even when full of people, a dire and foreboding atmosphere.

Equipment malfunction at amusement parks occurs in many movies. Often it is for humorous effect. In "Bean" (1997) the protagonist reprograms a flight-simulator ride and sends people flying, and in the movie "1941", made in 1979, a Japanese submarine fires on an amusement park near Los Angeles, causing a Ferris wheel to come off its base and roll down a pier into the ocean. Sometimes the effect is frightening, as in the aforementioned "Strangers on a Train", when a carousel whirls out of control, or gory, as in the crash at the beginning of "Rollercoaster" (1977).

As always, we would be grateful for reports from readers of other interesting cinematic depictions of amusement parks. You may contact us at ieee-history@ieee.org.



FOUNDATION SPONSORS A HISTORY PAPER COMPETITION FOR IEEE STUDENT MEMBERS continued from page 4

These students were the winners of a history paper competition sponsored by the IEEE Foundation. The contest, announced in 2003, asked students to research some topic in the history of electronics and to present their conclusions in a 10- to 20-page paper. From some two dozen papers received, eight papers were designated as Region winners or co-winners. The authors of these papers, along with the author of an outstanding honorable-mention paper, were invited to attend the conference, expenses paid.

The nine students were Asif Islam Khan from Bangladesh (Region 10), Allison Marsh from Maryland (Region 2), Ego Momah from Nigeria (Region 8), Sujoy Mukherjee from West Bengal, India (Region 10), Debo Onifade from Nigeria (Region 8), Sudhir Routray from England (Region 8), Louise St. Germain from Victoria, Canada (Region 7), Michael Tu from Pennsylvania (Region 2), and Lav Varshney from New York (Region 1).

The students attended the entire conference. They presented their research in short oral presentations on the first day of the conference and in a poster session on the second day. Their papers will be published as part of the conference proceedings. In an awards luncheon on the last day of the conference



Conference attendees discuss papers with students at Poster Session.

all nine students were honored. Also, three special awards, for presentation at the conference, were announced: Sujoy Mukherjee (first place), Asif Islam Khan (second place), and Michael Tu (third place). The presentations of these students enhanced the conference for everyone, and the experience of the conference gave these young people a greater appreciation for the heritage of the profession they have chosen.

THE MARCONI FOUNDATION continued from page 3

The project allowed the IEEE History Center to add many important oral histories to its collection, such as those by World Wide Web inventor Tim Berners-Lee, microchip pioneer Federico Faggin, room-temperature laser inventor Izuo Hayashi, Ethernet inventor Bob Metcalfe, and Jacob Ziv (the Ziv of the Lempel-Ziv Algorithm), to name a few. Researching the book was a fascinating intellectual journey into the creative process behind some of the huge advances in telecommunications in the latter half of the 20th century. Some of these breakthroughs were brilliant simplifications of complex problems. Some such as Arthur Schawlow's contributions to the laser, or Allan Snyder's photoreceptors were based on nature's paradigms, and some came from seeing new opportunities – such as John Pierce and Arthur C. Clarke's vision of how rockets (until that time, used for destruction) could be used instead to place communications satellites in orbit.



FARA, PATRICIA, *An Entertainment for Angels: Electricity in the Enlightenment*, Columbia University Press, New York, 2003 (paperback edition)

Originally published in hardback in 2002, this small, slim volume attempts to tell the story of the early pioneers of electrical science—from Boyle to Volta—in its social and cultural context. The story has been told before, but this is an amusing and well-written summary. The emphasis is on the individuals and their personal idiosyncrasies, but some detail is given of their experiments, and there are black and white illustrations sufficient to support the tale. Some might think Fara overreaches with her psychological analysis of careers, which she presents without detailed support (for example, “Volta (1745-1827) was a flamboyant man who thrived on controversy.”). Still, all in all it is an enjoyable and informative read about a critical stage in the emergence of modern electrical science and engineering.

Available from Columbia University Press, 136 S. Broadway, Irvington, NY 10533, Phone: 1-800-944-8648, Fax: 1-800-944-1844, <http://www.columbia.edu/cu/cup/sales/ind.html>, ISBN: 0-231-13148-8, \$19.50 (cloth), 192 pages, 15 illus.

HEMPSTEAD, COLIN and WORTHINGTON, WILLIAM, Eds, *Encyclopedia of 20th-Century Technology*, Routledge, NY, 2004

Routledge Press has announced the publication of a two-volume encyclopedia on technologies which have had a significant impact on industrial societies in the 20th century. Comprised of 395 essays of approximately 1000 words each, the two volume encyclopedia brings together the latest scholarship on 20th century technology in one reference.

Available from Routledge Taylor and Francis Group, 10650 Toebben Dr., Independence, KY 41051, <http://www.routledge-ny.com>, 1.800.634.7064, \$325.00, ISBN 1-57958-386-5

PERKOWITZ, SIDNEY, *Digital People: From Bionic Humans to Androids*, Joseph Henry Press, Washington DC, 2004

Approximately 8-10% of the population of the United States- 25 million people- is already bionic (using prosthesis and implants), and the number is rising as the population ages. Artificial parts for humans appeared at least as early as ancient Greece (wooden legs) mechanical hands (for maimed knights) in the 1400s, and glass eyes from Venice as early as 1579.

Sidney Perkowitz’s book explores the history, current state of the art, and future promise of the world of artificial limbs and organs, robots, and the interfaces between humans and machines. The first third of the book is a summary of the literary and historical accounts of “artificial beings,” from Mary Shelley’s *Frankenstein* to accounts of Babbage’s analytic engine and George Boole’s investigations into logic. From these foundations, Perkowitz explores the history of particular devices, such as heart pacemakers and hearing aids, as well as the advances in microchips which may one day allow artificial limbs a finer degree of articulation by processing commands from nerve impulses. Developments in robotics are closely related to bionics, and Perkowitz describes the progress which has been solving problems such as locomotion, visual and spatial understanding, and speech recognition.

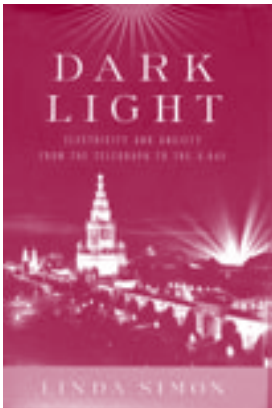


The metaphysics of the mind-body problem, once the province of philosophers, has turned into several problems within the world of artificial intelligence and artificial body parts. Perkowitz devotes a chapter to the opinions many writers and experts on artificial intelligence have expressed, such as whether an artificial brain can support a conscious artificial mind, and whether robots are likely to develop a sense of self.

In the final chapter, Perkowitz touches on some of the moral issues in implanting artificial devices into human beings, how we define human, and the uses and misuses to which increasingly sophisticated robots might be put.

Available from Joseph Henry Press, 500 Fifth St., N.W., Washington, DC 20001, www.jhpress.org, \$24.95, ISBN 0-309-08987-5, 237 pp., index

SIMON, LINDA, *Dark Light: Electricity and Anxiety from the Telegraph to the X-Ray*, Harcourt, Inc., New York, 2004.



Dark Light is a fascinating cultural history of American society during the last half of the nineteenth century and its reaction to the invention of electricity. Author Linda Simon, a professor of English at Skidmore College, became interested in these areas during her research on her biography, *Genuine Reality: A Life of William James*, when she began to consider how early electrification may have been connected to the growth of psychical research. Through her study of histories of electrification, as well as her survey of primary sources such as contemporary fiction and newspapers, she found a contradiction in the public's reaction: electricity was met with fear and skepticism in some applications, but not in others, and often not in the way that was expected.

Simon describes how, despite the advertising campaigns that touted electricity as the way to complete "the happy home circle" and to improve women's lives, domestic use of electricity spread relatively slowly, while at the same time, the use of electrotherapy was extremely popular with both patients and physicians. Through her study of this period, Simon challenges the belief that technological innovation is always embraced with enthusiasm and excitement, and examines the reasons why that was not the case. She also considers broader questions regarding public attitudes toward science, the roles of vitalism and spiritualism in shaping people's perceptions, and how the American public's reaction to technological innovation during this period relates to – and what it reveals about – the public's reaction to it today.

This history spans fifty years of technological innovation, from Samuel Morse's invention of the telegraph to Wilhelm Roentgen's discovery of the x-ray, a period which Simon refers to as "a time when electricity was a force stronger in the imagination than in reality." Her narrative is divided into three parts: the first provides a chronology of the public's introduction to electricity, focusing on the telegraph, the phonograph, lighting, and electrotherapy; the second examines beliefs about the body and its connection to electricity; and the third details demonstrations of and publicity regarding electricity, such as the first criminal execution and the Chicago World's Fair. Two figures, Thomas Edison and physician Charles Beard, are central to Simon's discussions, and she examines their work, along with that of other inventors, physicians, and the applications of this (then) new and unsettling technology.

Dark Light will be of interest to readers, both for its colorful portrait of technology in an uncertain, recent past, and for the issues it raises regarding technology in today's society. This book is available from Harcourt Inc., \$25, <http://www.HarcourtBooks.com>, ISBN 0-15-100586-9, 302 pp. + bibliographical references and index.

The IEEE History Center offers three different programs of support annually for young scholars pursuing the history of electrical engineering and computing: An Internship for an advanced undergraduate, graduate student, or recent Ph.D.; a Dissertation Fellowship for an advanced graduate student or recent Ph.D.; and a Post-Doctoral Fellowship for a recent Ph.D. The Internship and the Dissertation Fellowship are funded by the IEEE Life Members Committee; the Post-Doc is funded by Rutgers University. The Internship and the Post-Doc require residence at the IEEE History Center, on the Rutgers University Campus in New Brunswick, NJ, USA; there is no residency requirement for the Dissertation Fellowship. The IEEE History Center is pleased to announce the competitions for the 2005 awards:

IEEE FELLOWSHIP IN ELECTRICAL HISTORY - ACADEMIC YEAR 2005/2006

The IEEE Fellowship in Electrical History supports either one year of full-time graduate work in the history of electrical science and technology at a college or university of recognized standing, or up to one year of post-doctoral research for a scholar in this field who has received his Ph.D. within the past three years. This award is supported by the IEEE Life Members Committee. The stipend is \$17,000, with a research budget of \$3,000.

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

The Fellow is selected on the basis of the candidate's potential for pursuing research in, and contributing to, electrical history. Application forms are available on-line at http://www.ieee.org/organizations/history_center/fin_support.html. The deadline for completed applications is 1 February 2005. This completed application packet should be sent to the Chairman, IEEE Fellowship in Electrical History Committee, IEEE History Center, Rutgers—The State University of New Jersey, 39 Union Street, New Brunswick, NJ 08901-8538, USA. Applicants will be notified of the results by 1 May 2005.

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

IEEE HISTORY CENTER INTERNSHIP - 2005

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, NJ, USA.

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 project that is connected to his or her 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, advanced graduates, and, on rare occasions, recent Ph.Ds will also be considered. Special consideration is often given to scholars from outside the United States who might not otherwise have an opportunity to visit historical resources in this country.

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

There is no formal application form. To apply, please mail a curriculum vitae showing your studies in electrical history along with a cover letter describing the sort of project you would be interested in doing (see contact information below). The deadline for contacting the IEEE History Center is 1 March 2005.

POST-DOCTORAL FELLOWSHIP IN ELECTRICAL HISTORY **ACADEMIC YEAR 2005/2006** (*Pending availability*)

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 2005.

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

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

Applicants should submit a letter of interest, including a description of areas of research interest, curriculum vitae, writing sample (article or dissertation chapter), and three letters of recommendation. The deadline for completed applications is 1 April 2005. Note that this position may not become available; all those who make inquiries or submit applications will be informed if the position is withdrawn.

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:

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http://www.ieee.org/history_center

Herman H. Goldstine – Computer Pioneer and Historian of Numerical Analysis

Herman Goldstine, a mathematician whom the U.S. Army put in charge of its part of the ENIAC project, died in June at the age of 90. After World War II, Goldstine



Herman Goldstine (3rd from left) with von Neumann and other computer pioneers

joined the Institute for Advanced Study in Princeton and worked with von Neumann in developing the EDVAC, the Electronic Discrete Variable Automatic Calculator, and went on to become one of the chief scientists at IBM. After his retirement, Goldstine continued to serve science and technology as executive officer of the American Philosophical Society. Scholars of the history of technology are indebted to Goldstine for his books *The Computer from Pascal to von Neumann*, and *A History of Numerical Analysis from the 16th to the 19th Century*.

Harold W. Lord – Friend of the History Center and IFF Inventor

Staff of The IEEE History Center were saddened to learn of the death last June of friend and benefactor Harold W. Lord. Prior to his death, Lord made a generous donation of more than \$100,000 to the History Center, a gift which will increase the Center’s abilities to research and promote the history of electrical history.

Harold Lord worked for General Electric from 1926 until his retirement in 1966. The holder of 97 patents, Lord was known particularly for his invention of a timing circuit for line welders which enhanced the reliability of line welds, an IFF (Identification Friend or Foe) system, a missile detection system for aircraft, and a transformer winding system now named after him.

Lord was awarded the IEEE Magnetic Society’s Achievement Award, the IEEE Centennial Medal, and the IEEE Millenium Medal.



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