

## STATIC FROM THE DIRECTOR

It was less than four months ago that I wrote my previous "Static" column for the July newsletter, but it seems like ages. The whole of the United States—and yes the world—was changed by the events of 11 September, but those of us who live in the New York metropolitan area were impacted most directly. As one small example, those of you who understand New York geography will know that each evening when I cross the Verrazano Narrows Bridge when returning from the IEEE History Center in New Jersey to my home on Long Island, as I rise over the middle of the span of the upper deck, I get a magnificent view of the southern

skyline of Manhattan. That view has been forever changed.

Interestingly, in that last column I wrote of the IEEE History Center's increasing commitment to technological literacy, particularly as manifested through our IEEE Virtual Museum initiative. The events of the past several weeks have convinced me more than ever that it is important for our young people to be educated with an understanding and appreciation of modern technology and how it arose. This is true of youth in places where the technology is developed, so that they can work on solving the problems of today and tomorrow that lead to deprivation and hatred, and also in places where technology is feared and envied, and where individuals seek at once to oppose that technology and to use it against the rest of the world. I hope we will be able to continue to contribute to that educational mission

In any event, despite the disruptions, the staff of the History Cen-

*continued on page 11*



*Signal Hill, Newfoundland, Canada*

### 2001-2002 SHOT IEEE Life Members Prize Paper Announced

The 2001 prize paper has been awarded to David Mindell for his paper "Opening Black's Box: Rethinking Feedback's Myth of Origin," which appeared in the July 200 issue of *Technology and Culture*, Vol 41, #3 405-434. The IEEE Life Members' Prize in Electrical History was established by the IEEE Life Members, who fund the prize, and is administered by the Society for the History of Technology. The prize recognizes the best paper in electrical history published during the previous year, in this case 2000. Any historical paper published in a learned journal or magazine is eligible if it treats the art or engineering aspects of electrotechnology and its practitioners. Electrotechnology encompasses power, electronics, telecommunications, and computer science. The prize consists of a cash award of \$500 and a certificate. The committee invites submissions for the 2001 prize which will be presented at the Society's annual meeting in San Jose, CA, October 4-7, 2002. Please send a copy of the paper to EACH member of the prize committee by **1 May 2002**. ♦

#### IEEE HISTORY CENTER

### Issue 57 November 2001

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# IEEE HISTORY CENTER ORGANIZES TELECOM HISTORY CONFERENCE

By Michael N. Geselowitz, Ph.D.,  
Director

On 25-27 July 2001, the IEEE History Committee held the fifth in its biennial series of history workshops. The theme of this installment, held in St. John's, Newfoundland, Canada, was "The History of Telecommunications," and was organized by the IEEE History Center on behalf of the

Committee. The goal of these biennial conferences is to explore in workshop fashion the history of recent technology by bringing together the rare individuals who have a hand in both history and engineering, engineers with an interest in history, and some historians who will benefit from exposure to the



*CHT Attendees Visiting Transatlantic Cable Landing Site at Heart's Content, Newfoundland.*

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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engineering perspective while also bringing a more purely historical analysis to the table for the benefit of the engineers. This conference was by all measures and accounts a great success. Some 47 individuals from eight countries attended, with a balanced mix of historians and engineers. All of the 32 papers were well received, and the setting was superb. First, December 12, 2001, will be the centennial of Marconi receiving the first transatlantic radio transmission at Signal Hill, St. John's. The Province of Newfoundland and Labrador is celebrating the event all year, and our conference served as part of the festivities. Second, the last day of the conference was the 135th anniversary of the landing of the first transatlantic telegraph cable at Heart's Content, Newfoundland, a site which is now a museum. The conference included excursions to both landmarks (both of which are also IEEE Milestones in Electrical Engineering and Computing!).

**This year's conference was made especially**

**enjoyable by the inclusion of the IEEE student members. Engineers usually grow more interested in history later in their careers. In the past, young engineers have therefore not been a presence at these functions.** This time, however, the IEEE Foundation supplied a grant to fund for this conference a worldwide papers competition among the IEEE Student Branches and offer the winner in each of the 10 IEEE Regions an opportunity to present his or her winning paper at this conference. Students were encouraged to research their own local history of telecommunications for their submissions. The goal was to raise interest and awareness among students concerning the history of engineering in general and in their home regions in particular.

In all, five Regions submitted papers, and all five Regional winners were able to attend the conference and present in a special poster session. The students were also invited to a reception at the official residence of the Lieutenant Governor of Newfoundland and Labrador, A. Maxwell House. Dr. House gave the keynote address at the awards luncheon on the last day of the conference. The students got a rare opportunity to meet with senior

IEEE members as well as historians interested in them and their regions. They also were exposed to IEEE's historical activities, and several have already said that they will become involved in IEEE Milestones activities back home. As one student emailed soon after the conference, "the conference and the time that I spent with my fellow students and with all of you was great!" More information is available on the Center's Web pages at [http://www.ieee.org/organizations/history\\_center/cht\\_postconf.html](http://www.ieee.org/organizations/history_center/cht_postconf.html).

## IEEE Virtual Museum to Be Major Educational Initiative

Tremendous progress has been made on the IEEE Virtual Museum (IEEE VM) since the July newsletter. As we approach our launch date of early 2002, it is gratifying to see the hard work of so many people coming together to create a new and unique service that reaches out to students and educators. What has become clear in the year since work on the IEEE VM began is that we are not building a Website only; rather we are building an educational resource of which the website is a major, but not the sole, component. As we prepare to launch the site, we are making plans for the future. These include building new exhibits, collaboration with educational groups and educators, creation of teachers' guides, involvement of IEEE student members, and translation into many languages.

Our current and future success is due, in no small part, to IEEE VM supporters. Over the course of the past months the IEEE VM has been enthusiastically and generously supported financially and intellectually by the IEEE Foundation, the IEEE Life Members Committee, the Trustees of the IEEE History Center, the IEEE History Committee, and, of course, the IEEE Virtual Museum

Oversight Subcommittee. These groups have offered invaluable suggestions and encouragement and their support of this important project has been unwavering. We are thankful for their commitment.

I encourage you to visit the site in January 2002 as we launch what promises to be a growing and evolving service. Please visit <http://www.ieee.org/museum> and share your thoughts and opinions with us. Best wishes for the coming year.

## Room 204 – The IEEE History Center Assists in National Historic Landmark Research

Beginning in March of 2001, the IEEE History Center has been assisting the National Park Service select a technology-related site appropriate for nomination to go through the rigorous screening process which will — the Park Service and the IHC hope — result in a landmark which pays tribute to the importance of the history of technology. Because technology's nature is to develop, and modifications are frequent to the equipment and buildings where technology is developed, it is difficult to find a site intact enough to satisfy the very rigorous requirements for historical integrity. Having begun with a list of more than 230 sites of historic importance, the History Center was forced to eliminate most of them because little or nothing of the building or equipment remains. The shortlist of candidate sites included the site of Marconi's transmission at the Navy Yard, Washington, DC, the Victor factory and RCA buildings including Zworykin's Lab, Camden, NJ; the RCA Princeton Lab, Princeton, NJ; Marconi sites at Camp Evans, Wall, NJ; the Western Union office in New York, NY, the Alexander alternator, Schenectady, NY; Zworykin's iconoscope lab, Pitts-



*Room 204 is the site of E. H. Armstrong's lab where much of FM radio research was done*

burgh, PA; Farnsworth's San Francisco lab, and the Marcellus Hartley Dodge laboratory at Columbia University where Armstrong did much of his FM radio work.

Digging through archives, municipal records, and in some cases by visiting the sites on foot, the staff found that even many of the shortlist sites were found to be too altered to meet the criterion. Nothing remains of the Marconi masts except the footings; of the five buildings remaining from the huge RCA city-within-a-city in Camden, NJ, several are being turned into condominiums, and none of them was the building Zworykin's lab was actually in, it having been demolished long before. Gradually, the Armstrong labs emerged as the strongest intact candidate site.

Working with the gracious help of the Columbia architects, who provided original plans of Philosophy Hall building, Robie Lange of the Park Service's National Historic Landmark Survey and IHC staffer Robert Colburn spent a day matching old photographs with plans, reading Armstrong's papers, and investigating the building themselves hoping to identify positively "the cluttered basement lab" where the regenerative circuit, the superheterodyne receiver, and the superregenerative receiver were conceived and developed. It was with a feeling of some awe that they — guided by the architects — entered Room 204, and

began to match the old photographs with the room as it is now. Despite being used currently as a maintenance room, the space itself has not been seriously altered, and it is pretty certain from photographs showing Armstrong demonstrating equipment, that 204 was his lab during the 1920s. The Hartley Labs comprised more than one room, however, and it is known from the description of some of the experiments that multiple rooms were used. These rooms have been renumbered and walls have been moved since that time. More sleuthing remains to be done to determine which specific FM advances occurred in which rooms. Pupin's magnificent dark-panelled office is still there.

The next step will be to prepare a nomination, and we hope that, in time, the site of the Marcellus Hartley Lab will become a National Historic Landmark.

## Tesla Plaque Dedicated

On Tuesday 10 July, a ceremony was held in New York City honoring the great pioneer electrical engineer Nikola Tesla on the anniversary of his birth (actually, according to Tesla, he was born at the stroke of midnight between the 10th and the 11th, as lightning flashed). Tesla, who was born to Serbian parents on 10 July 1865 in

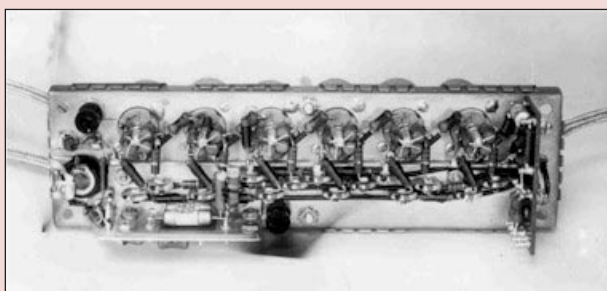
the Austro-Hungarian Military Frontier Province town of Smiljan in what is now Croatia, emigrated to the United States in 1884. A New York resident for almost 60 years, Tesla lived in the Hotel New Yorker at 8th Avenue and 34th Street from its opening in 1933 until his death on 7 January 1943. Several commemorative plaques were created in 1976 by the Yugoslav American Bicentennial Commission, but the one earmarked for the Hotel New Yorker was unable to be placed at that time. In 1989, the plaque was donated to IEEE, which installed it in the lobby of the United Engineering Building. When that building was razed, the plaque was turned over to the IEEE History Center for safekeeping.

By lucky coincidence, just as the plaque lost its resting place, a change in leadership at the Hotel New Yorker permitted it to be returned to its originally intended location. The IEEE donated the plaque to the Tesla Memorial Society, which arranged for it to be affixed with appropriate ceremony to the exterior of the 34th Street side of the hotel (this is diagonally across from Madison Square Garden, should any readers wish to view it as a "Thing to See and Do" the next time they are in Midtown Manhattan). Despite light drizzle (and even a few peals of thunder!) more than

100 people gathered to honor the great inventor. Governor George Pataki declared 10 July 2001 to be Nikola Tesla Day in the State of New York, and Mayor Rudolph Giuliani did the same for New York City, and a representative of the Mayor's office read both proclamations. Speakers included a former U.S. Representative and a Professor Emeritus of Physics from Columbia. IEEE History Center Director Michael Geselowitz represented IEEE, which had guarded the plaque all those years, and was asked to say a few words. It is always heartening to see a figure from electrical history recognized by the broader public.

## Mystery Photo Answer Adds to Center Archives

The IEEE History Center would like to thank John F. Wittibschlager, who identified July's mystery photo question. In addition to adding greatly to the Center's knowledge of the outdoor high-voltage laboratory of The Ohio Insulator Division of the Ohio Brass Company, John Wittibschlager also sent the Center a number of wonderful photographs of the laboratory and the equipment tested there. It is interest and support such as that which makes exploring the history of technology such a fascinating experience. ♦



## Mystery Photo Challenge

The IEEE History Center maintains a photographic archive of over 2,800 images. From time to time images are donated without any identification. Can you help identify this picture? We are looking for the description, year, purpose of equipment, etc.

## Staff Activities

### 2001-2002 History Center GAs

This year's History Center Graduate Assistants are: **Robert Alegre**, **Scott Bruton**, **Andrea Campetella**, **Damien Miller**, and **Tomas Tolvaisas**.

Born and raised in New Jersey, **Rob Allegre** is a graduate of the Richard Stockton College of NJ, where he majored in history. After taking his M.A. in Latin American Studies at the University of Arizona, Rob returned to the Garden State and is currently a Ph.D. student in the history department at Rutgers. Rob's research interests include labor history, gender ideologies, and urban studies.

**Scott Bruton's** research interests are in the history of science and Ameri-

can Indian history. Scott received his BA from Washington University (Major: History/Minor: Biology), then pursued a curatorial and collections management career, including employment at the Smithsonian Institution's National Museums of Natural History and American History, and the Missouri Historical Society. Prior to attending Rutgers, he earned his MA in American history at the University of Oklahoma.

**Andrea Campetella** was born in Buenos Aires, Argentina. She completed her undergraduate education at the National University of Buenos Aires, where she majored in Sociology. In 1998 she was awarded a W.K.Kellogg fellowship to pursue a MA degree at the New School for Social Research, in New York. She is currently a Ph.D. can-

didate in Latin American History at Rutgers University. She is interested in women's history, and her work focuses on South America.

**Damian Miller** is studying race, gender, and imperial culture in the late 19th and early 20th century west coast and Pacific regions.

**Tomas Tolvaisas** was born in Vilnius, Lithuania. He graduated with a BA in political science (international relations concentration) from Wake Forest University; followed by a MA in American diplomatic history from Purdue University in Indiana, and currently is a second year Ph.D. student in American diplomatic history at Rutgers. His research interests are: cold war, esp. US-Soviet confrontation over Eastern Europe. ♦

## PROGRAMS OF SUPPORT FROM THE IEEE HISTORY CENTER: 2002/2003

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 a junior graduate student, a Dissertation Fellowship for an advanced graduate student or recent Ph.D.; and a Post-Doctoral Fellowship for a recent Ph.D. The Internship and the Dissertation Fellowship are funded by the IEEE Life members Committee; the Post-Doc is funded by Rutgers University. The Internship and the Post-Doc require residence at the IEEE History Center, on the Rutgers University Campus in New Brunswick, New Jersey; there is no residency requirement for the Dissertation Fellowship. The IEEE History Center is pleased to announce the competitions for the 2001 awards:

### IEEE History Center Internship— 2002

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 will be 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. 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. The deadline for contacting the IEEE History Center is 1 April 2002.

### IEEE Fellowship In Electrical History—Academic Year 2002/2003

The IEEE Fellowship in Electrical History supports either one year of full-time graduate work in the **history** of electrical science and technology at a college or university of recognized standing, or up to one year of post-doctoral research for a scholar in this field who has received his Ph.D. within the past three years. **This award is supported by the IEEE Life Members Committee. The Committee is pleased to announce that, beginning with the 2002/2003 Fellowship, the stipend has been raised to \$17,000, and a research budget of \$3,000 has been added.**

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. The 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. The deadline for receipt of applications is 1 February. Applicants will be notified of the results by 15 April.

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

Application forms are available online or by request from the IEEE History Center (see below). The deadline for completed applications is 1 February.

### Post-Doctoral Fellowship in Electrical History—Academic Yr. 2002/2003

(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 2002 (pending final approval; this Post-doc is funded by the Faculty of Arts and Sciences of Rutgers University).

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:

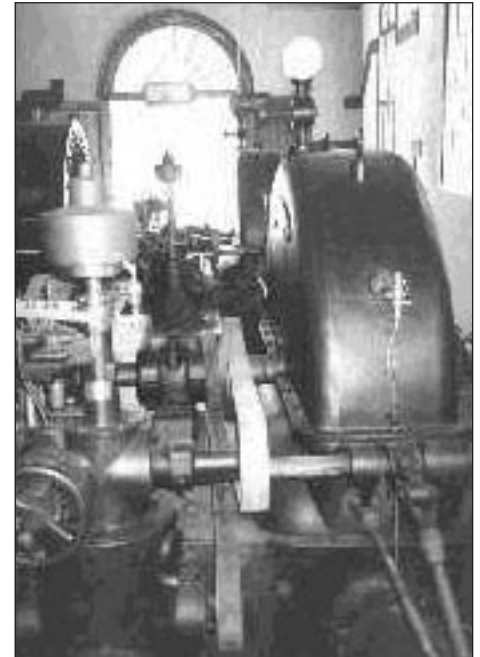
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## MILESTONES REACH A MILESTONE

2001 has proven a banner year for the IEEE Milestones program. As this newsletter goes to press, two Milestones have been dedicated this year: Long-Range Shortwave Voice Transmissions from Byrd's Antarctic Expedition, 1934 (IEEE Cedar Rapids Section, Region 4, February); and Electronic Technology for Space Rocket Launches, 1950-1969 (IEEE Canaveral Section, Region 3, February). Both dedications were covered in the previous issue. But by the time subscribers receive this newsletter, an astonishing four more should have been dedicated: US Naval Computing Machine Laboratory, 1942-1945 (IEEE Dayton Section, Region 2, October); Chivilingo Hydroelectric Plant, 1897 (IEEE Chile Section, Region 9, October); NAIC/Arecibo Radiotelescope, 1963 (IEEE Puerto Rico & Caribbean Section, Region 9, November, cosponsored by ASME); and Compatible Electronic Color Television, 1946-1953 (IEEE Princeton/Central New Jersey Section, Region 1, November). This puts the number of IEEE Milestones in Electrical Engineering and Computing more than 40. In addition, a record seventh Milestone for the year is scheduled to be dedicated in December: Transmission of Transatlantic Radio Signals, 1901 (IEEE UKRI Section). These Mile-

stones serve to demonstrate the expanding technical, chronological and geographical scope of the program—most notable are the two Milestones in IEEE Region 9, the first for that Region—the only Region previously lacking the honor! We hope to report on all of these dedications in our March issue; in the meanwhile you can learn more information on our Web pages: [http://www.ieee.org/organizations/history\\_center/milestones\\_list.html](http://www.ieee.org/organizations/history_center/milestones_list.html)

In addition, two Milestones have already been approved which we expect to be dedicated next year: Benjamin Franklin's Work in London, 1757-1775 (IEEE UKRI Section, Region 8) had been approved in 1990, but the dedication is awaiting the renovation of the house. Earlier this year, IEEE approved the First Transatlantic Reception of a Television Signal via Satellite, 1962 (IEEE France Section, Region 8). The France Section is planning to hold the dedication on the 40th anniversary of the event in July 2002, and it is hope that by then the IEEE Maine Section (Region 1) and the IEEE UKRI Section (Region 8) will be on board to honor simultaneously their ground stations, which were also involved in the telecast.



*Inside the Chivilingo Hydroelectric Plant (photo courtesy of IEEE Chile Section).*

Finally, in the pipeline are several strong proposals from around the world, including Region 10, which currently has only three Milestones. We will look forward in the future to keeping you posted on this important program that allows IEEE Sections to honor their local technological heritage, and to inform their local community of the importance of engineering and engineers to everyday life. ♦



*The Naval Computing machine Lab, Dayton OH (copyright: Smithsonian Institution).*



*The Arecibo Radio Telescope (courtesy of the NAIC-Arecibo Observatory, a facility of the NSF, Tony Acevedo).*

## Bibliography

BARJOT, DOMINIQUE, Henri Morsel, and Sophie Coeuré, editors. *Stratégies, gestion, management. Les compagnies électriques et leur patrons 1895-1945*, Fondation Électricité de France, 2001.

In February 1999 thirty researchers, most of them French, met in Paris to compare their findings concerning the management of the companies engaged in electricity production and distribution in France prior to nationalization in 1946. This meeting was the twelfth colloquium of the Association pour l'histoire de l'électricité en France. In addition to an introduction and a conclusion, there are thirty papers grouped into three parts. These are scholarly articles, with sources given in footnotes and a good deal of quantitative information conveyed in tables and graphs.

The papers of the first part illuminate the setting within which the electric companies operated, both the international context (Belgium, Switzerland, Britain, and Italy given special treatment) and the structural constraints of such businesses within France (mainly technological and financial). The second part follows the historical ups and downs of the power industry, especially the impact of two world wars and the economic crisis of the 1930s. The third part focuses on the strategies and management techniques of the leaders of the industry. It is subdivided into three parts: models (such as that provided by the iron industry), means and results (including case studies of particular electric-power providers), and people (such as the engineers of the Corps des Ponts et Chaussées in the electric industry).

Available from the Fondation Électricité de France, 26, rue de la Baume, 75008 Paris; tel. 1 40 42 22 22, fax 1 40 42 29 69; softcover, ISBN 2 909484 11 4; 533 pp., index.

FRIEDEWALD, MICHAEL. *Die »Tönende Funken«: Geschichte eines frühen drahtlosen Kommunikationssystems 1905-1914*, GNT-Verlag, 1999.

Another in the impressive series of history-of-technology studies published by GNT-Verlag, this book tells the story of an early system for wireless communication. Telefunken, formed in 1903, developed the so-called quenched-spark transmitter, which produced a more regular set of oscillations than did Marconi's spark transmitters. But Telefunken was not in a position to challenge the virtual monopoly that the Marconi companies had on ship-to-shore communication, which was at the time the only large commercial market for wireless. Hence the Telefunken system was developed mainly for the German army and navy.

Michael Friedewald tells the story of the quenched-spark system. After an introduction (Chapter 1) and a presentation of the state of telecommunications—both wired and wireless telegraphy—at the beginning of the century (Chapter 2), he describes the technical development of the quenched-spark system (Chapter 3). There follows an account of Telefunken's attempts to market the system for maritime use (Chapter 4) and an account of the development of a radio-communication network for the German colonies (Chapter 5). Final remarks (Chapter 6) concern the lasting impact of the quenched-spark system, which was particularly great in maritime use. The book, which carefully cites sources of information, is particularly valuable

for its explication of the interplay of technical innovation and business strategy.

Available from GNT-Verlag, Schloßstraße 1, 49356 Diepholz, Germany; tel. 1 49 5441 927129, fax 1 49 5441 927127; www.gnt-verlag.com; softcover, ISBN 3 928186 38 8; 185 pp., index.

HAYES, JOY ELIZABETH, *Radio Nation: Communication, Popular Culture, and Nationalism in Mexico, 1920-1950*, University of Arizona Press, 2000

The modern nation would be inconceivable without mass communication technologies, technologies which extend cultural practices, symbols, and narratives to millions of people simultaneously. This is particularly true in Mexico, where a new mass communication technology — radio broadcasting — came to maturity at the exact moment that the post-revolutionary state and commercial interests were looking for an economical means of reaching the Mexican people. Joy Elizabeth Hayes' book *Radio Nation* examines the correlation between radio broadcasting and nation-building; as well as the conflicting elements (commercialization, foreign culture, attempts by North American corporations to build markets, popular culture, government-disseminated nationalist culture, etc.) who attempted to control the new medium. Hayes documents the use of the new medium by the presidents of Mexico, most notably Lazaro Cardenas — who, while not an inspired radio speaker himself, understood the applications to his far-flung constituency, as well as radio's ability to extend the





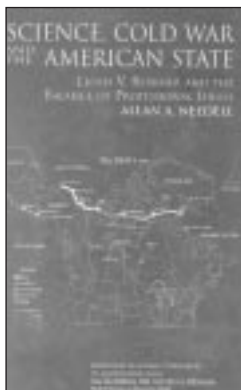
“warmth” of bodily contact through the connection of the spoken word to a people whose culture celebrated the auditory.

Hayes’ book is an excellent view of technology, and the ways it is used, in the act of making history and shaping human community.

Available from the University of Arizona Press, Tucson, AZ, USA, +1 520 621 3920, fax: +1 520 621 8899, <http://www.uapress.arizona.edu>, \$35.00, cloth, ISBN 0-8165-1852-1, 190 pp., index, charts

NEEDELL, ALLAN A., *Science, Cold War and the American State: Lloyd V. Berkner and the Balance of Professional Ideals*, Harwood Academic Publishers, 2000.

A momentous consequence of World War II and the Cold War was the vastly increased involvement of scientists and engineers with the U.S. government, as federal funding for science multiplied and as more and more scientists and engineers worked for or with a plethora of new government organizations. Allan Needell’s book *Science, Cold War and the American State* illuminates this process by examining the actions of an extremely influential individual, the radio engineer and ionospheric physicist Lloyd V. Berkner.



At an early age Berkner became interested in radio, setting up station 9AWM as a 14-year-old just after the first world war. After high school, he worked several years as a radio operator on various ships before returning home to study electrical engineering at the University of Minnesota. After gradua-

tion Berkner went to work for the Radio Section of the Bureau of Standards, and one of his first assignments was as radio engineer for Admiral Richard Byrd’s famous flight over the Antarctic. He remained at the Bureau until 1933, studying radiowave propagation and the structure of the ionosphere (using the pulse-echo technique), then moved to the Carnegie Institution of Washington, where he continued his studies of the ionosphere. During World War II Berkner was leader of radar and communications electronics procurement for the U.S. Navy Bureau of Aeronautics.

After the war Berkner became manager of a new research and development organization run jointly by the War and Navy Departments. In 1951 he became president of Associated Universities, Inc. He also served as adviser to the government in several capacities and was a champion of the space program in the 1960s. Berkner also played a large role in shaping the national security infrastructure created outside the military, notably the Central Intelligence Agency and the National Security Council.

Allan Needell is chairman of the Division of Space History of the Smithsonian Institution’s National Air and Space Museum. He has written a scholarly book, which draws heavily on a wide variety of unpublished materials, that is nevertheless engagingly written in a narrative manner, following Berkner’s career chronologically while carefully explaining the scientific, governmental, and other contexts Berkner found himself in.

Available from Harwood Academic Publishers, an imprint of the Gordon and Breach Publishing Group, P.O. Box 32160, Newark, NJ 07201, 800 545-8398; <http://www.gbhap.com>, hardcover, ISBN 90-5702-621-X; xi + 404 pp., index.

LIENHARD, JOHN, *The Engines of Our Ingenuity: An Engineer Looks at Technology & Culture*, Oxford University Press, New York, 2000.

John Leinhard is a well-known mechanical engineer turned historian of his profession. This book is loosely based on a daily broadcast essay, produced by KUHF-FM in Houston for National Public Radio, which he authored and hosted. As a result, these well-written essays are all over the map in terms of points made as well in terms of examples used. Each one, although fun and standing alone, does try to make the next in a series of points about the creative process and how it works, which are presented in a very roughly chronological perspective. For example, Chapter 3, “God, the Master Craftsman,” is about clock-making and cathedral building in 13th and 14th century Europe, and tries to address the issue of religious ideology in technology, but it manages to touch upon the poetry of Shelley in the early 19th century, Lord Kelvin’s measurement of the age of the Earth in the late 19th century, and the autobiographical Education of Henry Adams in the early 20th century. Anyone interested in invention and innovation will enjoy this book. Of particular note for readers of this newsletter include: Chapter 10, “War and Other Ways to Kill People,” which is mainly about the role of the military in 20th century technology, but manages to smoothly work in the role of the electric chair in the Edison/DC vs Tesla/AC battle; and Chapter 14, “Who Got There First,” about the concept of the individual heroic inventor, which draws many of its examples from electrical technology.

Available from: Oxford University Press, 198 Madison Avenue, New York, NY 10016, [www.oup.com](http://www.oup.com), \$25.00, hardcover, ISBN 0-19-513583-0, 262 pp., index ♦

## BAKKEN VISITING RESEARCH FELLOWSHIPS

Each year, 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. The fellowship is a maximum of \$1,300 to help defray expenses of travel, subsistence, and other direct costs of conducting research at the Bakken. Minimum period of residence is one week; next deadline is 15 February 2002.

For details and application guidelines, please contact Elizabeth Ihrig, Librarian, The Bakken Library and Museum, 3537 Zenith Avenue South, Minneapolis, MN 55416, USA (telephone: 612-926-3878, extension 227; fax: 612-927-7265; e-mail: [www.thebakken.org](http://www.thebakken.org)) ♦

## ELECTRICAL TECHNOLOGIES IN THE MOVIES: PUSH-BUTTON CONTROL AND CONTROL CENTERS

Push-button control seems the ultimate: a touch of the finger triggers the appropriate action. As we all know, however, things can still go wrong. In the 1968 Beatles movie "Yellow Submarine" we see, among the controls of the submarine, a button for every contingency. But Ringo, who can't help trying things, ejects himself from the submarine by pushing a button he's just been told not to push. In the James Bond movie "Thunderball" (1965), the head of Spectre eliminates one of his operatives using a push-button controlled chair: the victim seems to go up in flames, then is emptied out of the chair automatically. This is parodied in "Austin Powers: The Spy Who Shagged Me" (1999), where we later see Dr. Evil and Mini Me struggle to control their powered chairs. Another Bond movie, "Diamonds are Forever" (1971), shows push-button control of the movement of a coffin to the cremation oven, including control of curtains and music. Push-button controlled beds can be seen in many movies, as in "Breakfast at Tiffany's" (1961), where we see someone unable to control such a bed.

Control centers realize the ideal of monitoring and controlling a variety

of processes, often quite dispersed in space, and doing so from a single location. The fire-control rooms of warships provide an archetype of a control room, and in the Woody Allen movie "Everything You Always Wanted to Know About Sex" (1972) the control center of the body is clearly portrayed as similar to the control room of a ship. Another archetype of the control room comes from the space program. One of the earliest depictions in movies of such a control room occurs in "The Road to Hong Kong" (1962). Here, in the last of the Bob Hope - Bing Crosby "Road" movies, we see a mission-control center, which, because of the abundance of cathode-ray screens, is likened to a television factory. James Bond movies often feature a control room, and these indicate the technologies of the time. For example, in "Diamonds are Forever" (1971) the control room contains a bank of tape drives and the overall control comes from the program on a cassette tape. In the more recent "Tomorrow Never Dies" (1997) there is an elaborate control-center,



which includes a Chinese keyboard in front of a computer monitor, that can be hidden away at the touch of a button. In Bond movies the control rooms often belong to villains, who are made more evil by their mastery of technology. In "The Man with the Golden Gun" (1974) the villain Scaramanga has a maze-like house in which he controls such things as gun-firing mannequins, and in "Moonraker" (1979) the evil billionaire Jugo Drax has a control center to implement his plan of launching nerve-gas projectiles from an orbiting space-station.

As always, we would be grateful for reports from readers of this newsletter of other interesting cinematic depictions of push-button control and control centers. You may contact us at [history@ieee.org](mailto:history@ieee.org) ♦

## Static from the Director

*continued from page 1*

ter and of the IEEE as a whole have continued to work enthusiastically on behalf of you and the other members and customers of IEEE. I would like to congratulate and thank my staff. A lot of great things have been taking place at the Center both before and after the tragic events of September. The summer history conference that we ran on behalf of the IEEE History Committee was a smashing success [see pg. 2]. The IEEE Virtual Museum continues to be developed on schedule [see pg. 3]. Support for it remains strong from within IEEE,

and external organizations that have been approached have all expressed preliminary support. The IEEE Virtual Museum will be demonstrated to several IEEE groups in the coming months, and look for announcement of the public launch in the March newsletter. The Milestones Program continues to go strong. There are a record five dedications scheduled for the last quarter of the year, and we will be able to feature them as well in our March newsletter. As always, you can follow all of these developments and others—as they occur!—on our Web pages: **[http://www.ieee.org/history\\_center](http://www.ieee.org/history_center)**.

Finally, I wanted to say congratulations and thank you to YOU, our readers and supporters. Our work is done for you, but it could not be done without you. In the last issue we also included a special cover note about the Friend-to-Friend Challenge. Well, I am happy to announce that thanks to you we met that challenge from Paul Baran, member of the Trustees of the IEEE History Center. We raised \$100,000 during this past annual billing cycle (vs. about \$85,000 in the previous cycle), and Paul has generously matched that \$100,000. All of our supporters will be publicly recognized in our annual honor roll in our March newsletter issue. ♦

*Visit our web site*

**[http://www.ieee.org/history\\_center](http://www.ieee.org/history_center)**

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## Surf City

The Smithsonian Institution's History **Wired: A few of our favorite things** is an experimental site that introduces visitors to some of the three million objects held by the National Museum of American History, Behring Center.

With less than five percent of the vast and diverse collection on public display in their exhibit halls, they hope that Web sites like this will bring many more of their treasures into public view. The initial 450 objects, selected by curators from across the Museum, include famous, unusual, and everyday items with interesting stories to tell. <http://historywired.si.edu/index.html>

PBS maintains a companion web site for their television special entitled **Triumph of the Nerds**. The web site contains a history of computer, biographies of the Nerds, Can you Guess the Computer (Flash enabled) and other topics of interest. It also contains the entire transcript of the television program. The television special is very entertaining! <http://www.pbs.org/nerds/>

In July 2001, the History Center sponsored the "History of Telecommunications Conference." If you would like to learn about the history of the Atlantic Cable, we recommend Bill Burns' site: **History of the Atlantic Cable & Submarine**

**Telegraphy**. This site contains a great deal of information, along with excellent photographs and other resources. <http://www.atlantic-cable.com/>

The History Center has added a new feature to its web site, **Web Archive**. From time-to-time we post special history pieces that are time sensitive. The first archived piece added to this page is Woman's History Month (March 2001). We plan to add links to historical pieces in the future. [http://www.ieee.org/organizations/history\\_center/web\\_archive.html](http://www.ieee.org/organizations/history_center/web_archive.html) ♦



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