

# IEEE History Center

ISSUE 114, November 2020

## THE IEEE HISTORY CENTER TURNS FORTY



*The IEEE History Center and the Compact Florescent Bulb are both 40!  
Edison would be proud.  
(Image: Wikicommons)*

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

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By Michael N. Geselowitz, PhD

In my column in the last issue, I pointed out that 2020 is the 40th anniversary of the IEEE History Center being founded as the staff support/partner of the IEEE History Committee. The actual anniversary date was in August, but you will see in the story on page 4 that most of the commemoration is taking place this fall (virtually of course). The column told a narrative of the history of IEEE's historical activities, and the issue contained updates on the latest events in each of the important

program areas. This issue contains such updates as well, many of which point out how we have adapted to the COVID crisis.

Engineers, however, like to see numbers as well as stories. And the overall numbers tell an impressive story on their own. In forty years, History Center staff have edited, transcribed, and posted more than 800 oral history interviews. We also conducted most of the interviews; a few were conducted by History Committee volunteers before there was a History Center, and since then we have also encouraged a small number of peer-to-peer in-

## HOW CAN THE HISTORY CENTER HELP YOU?

*A Handy Guide to Some of Our Programs and Contacts*

Engineering & Technology History Wiki: [https://ethw.org/Main\\_Page](https://ethw.org/Main_Page)

List of dedicated IEEE Milestones: [https://ethw.org/Milestones/List\\_of\\_Milestones](https://ethw.org/Milestones/List_of_Milestones)

How to Propose an IEEE Milestone: [http://ieemilestones.ethw.org/Milestone\\_Guidelines\\_and\\_How\\_to\\_Propose\\_a\\_Milestone](http://ieemilestones.ethw.org/Milestone_Guidelines_and_How_to_Propose_a_Milestone)

Milestone proposals in process: [http://ieemilestones.ethw.org/Milestones\\_Status\\_Report](http://ieemilestones.ethw.org/Milestones_Status_Report)

Oral History Collection: [https://ethw.org/Oral-History/List\\_of\\_all\\_Oral\\_Histories](https://ethw.org/Oral-History/List_of_all_Oral_Histories)

REACH Program (free online materials for teaching the history of technology): <https://reach.ieee.org/>  
Support for scholars:

Fellowship in the History of Electrical and Computing Technologies:  
<https://www.ieee.org/about/history-center/fellowship.html>

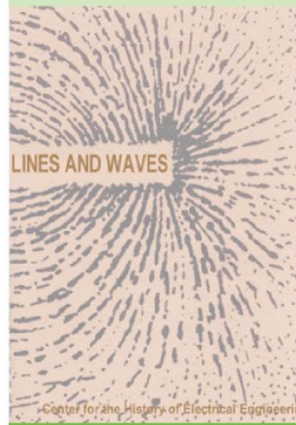
Pugh Young Scholar in Residence:  
<https://www.ieee.org/about/history-center/internship.html>

Middleton History Prize (awarded to a book in the history of technology):  
<https://www.ieee.org/about/history-center/middleton-award.html>

## IEEE HISTORY CENTER TIMELINE

### 1981

1st exhibit,  
"Lines and Waves,"  
opens at IEEE  
Electro conference

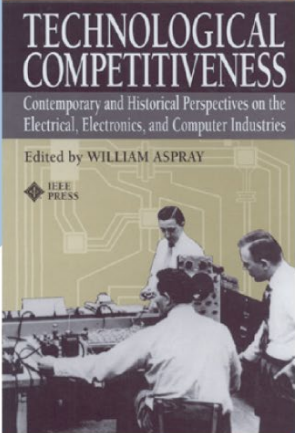


### 1985

1st Milestone:  
Landing of the  
Transatlantic cable,  
Heart's Content,  
Newfoundland,  
Region 7

### 1991

1st conference:  
"Technological  
Competitiveness"



interviews by volunteers (see page 3). We have supported the History Center and the IEEE Board of Directors in approving more than two hundred Milestones. After two earlier public websites, we built the Engineering & Technology History Wiki (ETHW), which contains more than 5,000 web pages and 15,000 files (as well as hosting the Milestones and the oral histories) and receives more than a million visits each year. We built a separate IEEE REACH website for pre-university education, which, though in its infancy, is on track to receive more than

100,000 page views this year. We built the IEEE Archives, which contain more than fifteen cubic meters of papers (much of it digitized on the ETHW), more than 1,000 objects, more than 6,000 images, more than 2,500 subject files, and several thousand books in a separate research library. We have sponsored or co-sponsored more than a dozen IEEE conferences. We have published 114 newsletters. We have written or presented countless books, articles, papers, columns, lectures, and blogs.

*“The reader can do the math on the average annual output. These accomplishments reflect the expertise, enthusiasm, and hard work of a staff that it has been my honor to lead, as the fourth director, for twenty three of the History Center’s forty years.”*

The reader can do the math on the average annual output. These accomplishments reflect the expertise, enthusiasm, and hard work of a staff that it has been my honor to lead, as the fourth director, for twenty three of the History Center’s forty years. It also represents tremendous dedication and counsel from the volunteers of the IEEE History Committee. But, as is usual in our end of year newsletter, I would like to point out that it also speaks to the great commitment and support from you, our donors. Early on, it was decided that IEEE’s historical

activities could have more impact if they leveraged private philanthropy in addition to IEEE funds. You have come through for us time and time again, and I hope that we can continue to earn your support as we help to preserve, research, and promote the proud heritage of IEEE and its fields of interest.

Finally, let me wish you and your family a happy and safe holiday season, and a good new year when I hope that we will return to more in-person activities.

## NEWSLETTER SUBMISSION BOX

The IEEE History Center Newsletter welcomes submissions of letters to the editor, as well as articles for its **Reminiscences** and **Relic Hunting** departments. “Reminiscences” are accounts of history of a technology from the point of view of someone who worked in the technical area or was closely connected to someone who did. They may be narrated either in the first person or third person. “Relic

Hunting” are accounts of finding or tracking down tangible pieces of electrical history in interesting or unsuspected places (in situ and still operating is of particular interest). Length: 500-1200 words. Submit to [ieee-history@ieee.org](mailto:ieee-history@ieee.org). Articles and letters to the editor may be edited for style or length.



## Celebrating 40 Years



**1995**  
250th oral history recorded (Lionel Barthold)

**2002**  
IEEE Virtual Museum opens



BELL LABS MEMOIRS:  
Voices of Innovation



EDITED BY A. MICHAEL NOLL AND MICHAEL GESELOWITZ

**2011**  
1st IEEE History Center Press Book: *Bell Labs Memoirs*

**2015**  
Engineering & Technology History Wiki goes live



Thelma Estrin Oral History  
An interview with Thelma Estrin, biomedical computing pioneer



**2016**  
IEEE REACH program launch

## HISTORY CENTER EVENTS WEB PAGE

As a service to IEEE members, as well as to the interested public, staff of the IEEE History Center is very excited to announce that it has set up a web page for upcoming history events <https://www.ieee.org/about/history-center/events.html> In addition to History Center programs, the page is intended to publicize history events by IEEE organizational units. If you

have a history related event you would like us to post for you, please email the information to [ieee-history@ieee.org](mailto:ieee-history@ieee.org)

The page will be linked to by other IEEE events pages as part of an IEEE volunteer-led initiative to create an online resource for IEEE-wide events.

## LIFE FELLOW ORAL HISTORY PROJECT AIMS TO CAPTURE THE ACHIEVEMENTS OF IEEE'S EXTRAORDINARY INNOVATORS

*"IEEE Life Fellows, as recognized by their membership grade, have contributed to the world body of knowledge in IEEE fields of interest and achieved extraordinary accomplishments, while demonstrating a strong commitment to IEEE and to the profession."*

The IEEE History Center hosts more than eight hundred oral history interviews of important engineers on the Engineering & Technology History Wiki. IEEE History Center staff conducted the great majority of these interviews. Not surprisingly, many of the interviewees are IEEE Fellows.

Earlier this year, 2020 IEEE President-Elect Kathy Land presented us with a challenge. Although our oral history collection of

engineers is one of the finest, it represents a very small slice of the more than 3,000 IEEE life fellows (there are more than 7,000 fellows and more than 20,000 life members of other grades). IEEE Life Fellows, as recognized by their membership grade, have contributed to the world body of knowledge in IEEE fields of interest and achieved extraordinary accomplishments, while demonstrating a strong commitment to IEEE and to the profession. Dr. Land wondered, was there a way to capture the memories of a much higher percentage of these most important IEEE members? For example, could we obtain interviews from ten percent of the Life Fellows that have not previously been interviewed?

Collecting oral histories is labor intensive, and requires some specific knowledge of technique. In the past, History Center staff have trained volunteers in specific IEEE organizational units to conduct a small number of interviews and we created a training video, so that members could train at their own convenience. (An updated training video will be available in November 2020) Such peer-to-peer interviewing is advan-

tageous because the interviewer probably knows the technical field better than a historian and may even know the interviewee personally, making the subject more at ease. Finally, members of geographically based units interviewing local colleagues can cut down on travel time and expenses. Despite these advantages, however, the program remained small. Volunteers have a lot of other activity—IEEE and otherwise—on their plates.

Our response to Dr. Land was that her idea was doable, but not with staff resources. However, it could be accomplished if we ramped up the peer-to-peer program. With her encouragement, we enlisted IEEE past president Jim Jeffries as the volunteer champion, and applied to the IEEE New Initiatives Committee (NIC) for funding for the various out of pocket costs the program would entail. T. Scott Atkinson, Chair of the IEEE Life Members Committee, and Janina Mazierska, Chair of the IEEE History Committee, were also involved in the proposal. To our delight, we received the initial funding in the second half of this year to begin the program. The first task, already underway, is to update the ten-year-old training video. The next tasks will be to reach out to IEEE Life Fellows, and identify which ones are willing to be interviewed, and determine their location and availability. Then we will recruit interviewers by marketing through organizational units.

One change from the original game plan caused by the global COVID pandemic, is that—at least initially—the interviews will be conducted via the Internet rather than in person. The History Center has started conducting other interviews remotely, and this has been working well. This change removes a geographical restraint in matching interviewee and interviewer. If NIC provides follow-up funding for next year, the project will be in full swing. Look for an update in the History Center's March 2021 newsletter. In the meanwhile, if you are interested in learning more about this exciting project, please contact Dr. Mary Ann Hellrigel at the History Center at [m.c.hellrigel@ieee.org](mailto:m.c.hellrigel@ieee.org).

## ETHW UPDATE

### New Oral Histories

The Engineering and Technology History Wiki (ETHW) has one of the largest oral history collections in the world with engineers and technologists. Recently added oral histories included Martin Bloch, the founder of Frequency Electronics, Inc., Ulrich Rohde, chairman of Synergy Microwave Corp., Léandre Pourcelet, the 1995 recipient of the Judith A. Resnik Award, Barbara Filas, the 2005 president of the Society for Mining, Metallurgy & Exploration, and Cyril O'Connor, the CEO of the South African Minerals to Metals Research Institute.

To view these and more than nine hundred other oral histories, visit: [https://ethw.org/Oral-History:List\\_of\\_all\\_Oral\\_Histories](https://ethw.org/Oral-History:List_of_all_Oral_Histories)

## IEEE REACH - AHEAD OF THE CURVE

By Kelly McKenna, IEEE REACH Program Manager

The IEEE REACH program (Raising Engineering Awareness through the Conduit of History) and the free resources it provides to pre-university educators have been ahead of the curve in terms of both its format and its content. <https://reach.ieee.org/>

The education community, as have numerous others, has been faced with some extreme and unique challenges brought on by the COVID pandemic. The pandemic has forced schools to close across the globe, and they have had to develop new ways to provide remote learning options for students. Currently, remote learning platforms are a necessity for schools, although unfortunately not everyone has access to the internet. Because of REACH's design structure, the REACH program was immediately available—and remains available—to assist teachers, parents, and students in a fundamental way. All of the REACH program's free resources are designed in downloadable PDF formats. PDF formats are compatible for use on any remote learning platform. In addition, they can be printed and used offline. The REACH videos are also downloadable in a variety of video formats. As such they too are available for offline use and with different remote learning applications.

Although there are countless education resources available online, many organizations had quickly to make changes to the format of their resources in response to the shift to an all on-line learning environment. REACH was ahead of this design challenge and could immediately, and easily, be accessed and used by all those in need of learning resources.

In July 2020, the International Technology and Engineering Educators Association (ITEEA) released its revised standards for technology and engineering literacy (STEL). These standards now include the "History of Technology" as a core discipline of the standards! Although the context of this subject has previously been included in different standards, this is the first time the "History of Technology" has been specifically highlighted as a core discipline. Learning about technology in its social and historical context is now viewed as a necessity to understanding technology and engineering! REACH covers the topic in all of its

### IEEE's Ethics History Repository (IEHR) has been Updated

Walter Elden, Concerned Ethics Volunteer, and editor of the IEHR, has added a second part to the IEHR, which brings the Repository up to 2020 in reporting on ethics history. The update emphasizes cases handled over the past forty two years and highlights the Barus awards issued by the SSIT to individuals for "Outstanding Service in the Public Interest", supporting IEEE's tagline, "Advancing Technology for Humanity". The first part of the IEHR can be viewed at <http://ethw.org/iehr> and the second part at <http://ethw.org/iehr2>



lesson plans and resources, and it also addresses two other core disciplines found in the new standards: the Influence of Society on Technological Development, and the Impacts of Technology. STEL validates the need for the REACH program and its importance for improving technology and engineering literacy skills of all students. REACH is one of the only open education resource (OER) programs available that specifically addresses these new core disciplines and the social context of STEM literacy. REACH was ahead of the curve on this important curriculum and meets educators' needs as it relates to these new standards.

None of this would be possible if it hadn't been for the generosity of the donors who support the REACH Program. It is because of our donors that the IEEE REACH program, an IEEE public imperative, is available and able to meet the needs of teachers, students, and now parents especially during the COVID pandemic. And it is only with donors' gracious support that the program will continue to help to improve technology and engineering literacy of all students. As the History Center celebrates its fortieth anniversary, I would like to celebrate this success with all of you, the IEEE volunteers, who ensure that we continue to increase public understanding of the role of engineering in society and prepare students to be informed and well prepared citizens for years to come.

Please visit [reach.ieee.org](https://reach.ieee.org) to access the program. Program donations may be made here:

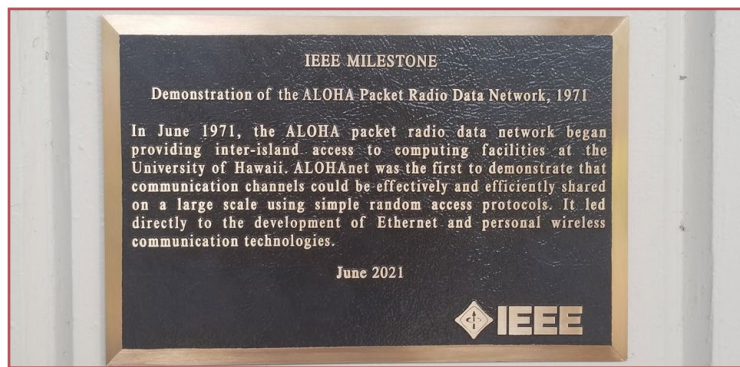
[https://www.ieeefoundation.org/support\\_REACH](https://www.ieeefoundation.org/support_REACH).

## MILESTONES UPDATE

By the time you read this, the first two virtual IEEE Milestone dedications will have taken place. They are Demonstration of the ALOHA Packet Radio Data Network, 1971, and Piezoelectric Quartz Oscillator, 1921-1923. The virtual format is an adaptation to the many changed circumstances forced by the COVID pandemic. Thanks to the creativity and flexibility of IEEE volunteers, the Milestones program has maintained its momentum.

The IEEE History Committee met via teleconference on 7 October. The main order of business was action on Milestone proposals. The History Committee voted to recommend Board of Directors approval of three milestone proposals:

1. Giant Metrowave Radio Telescope (GMRT), 1994
2. Intel 4004 Microprocessor, 1971
3. Development of the Commercial Laser Printer, 1971-1977



*The ALOHAnet Milestone plaque installed and ready for its virtual dedication.  
(Photo credit: Dr. Brennon Moriokoa, University of Hawaii at Manoa College of Engineering)*

The IEEE Board of Directors has given final approval to four proposals:

1. Folsom Powerhouse, 1895
2. Inverter Air Conditioners, 1980-1981
3. Multiple Silicon Technologies on a Chip, 1985
4. QR (Quick Response) Code, 1994

For details, view the Milestones Status Report at:

[http://ieemilestones.ethw.org/Milestones\\_Status\\_Report](http://ieemilestones.ethw.org/Milestones_Status_Report)

A list of dedicated Milestones can be found at:

[https://ethw.org/Milestones:List\\_of\\_Milestones](https://ethw.org/Milestones:List_of_Milestones)



## TECH HISTORY ON THE WEB: STAFF FAVORITES

### TECHNOLOGICAL HISTORY ON THE WEB

#### Some IEEE History Center staff favorites

In the same way that historians have shown how alchemists contributed to the development of modern chemical science, astrologers, by demanding more accurate astronomical charts, helped lay the foundations of modern data analysis. From his book, data scientist Alexander Boxer makes the short case online: [www.atlasobscura.com/articles/ancient-astrology-data-science](http://www.atlasobscura.com/articles/ancient-astrology-data-science)

Christine Blondel and Bertrand Wolff developed a major website on the origins of electrical science in the late 18th and early 19th centuries for CNRS. In French, with many English translations provided by Andrew Butrica: [www.ampere.cnrs.fr/parcourspedagogique/zoom/courant/ohm/index.php](http://www.ampere.cnrs.fr/parcourspedagogique/zoom/courant/ohm/index.php)

A 1902 film of the “flying train” in Wuppertal, Germany, has been digitized and restored by the Museum of Modern Art in New York. This enthusiastic article links to the video, along with a colorized version and a recent video of the Wuppertal Schwebebahn: <https://hyperallergic.com/584274/moma-germany-flying-train-film/>

Professors Francisco A. González Redondo and Josu Aramberri have built on the 2007 IEEE Milestone for Early Developments in Remote Control to develop a popular exhibit and an extensive website of Leonardo Torres-Quevedo’s life and work in 19th century aviation and early 20th century wireless remote control and automation: [www.torresquevedo.org/](http://www.torresquevedo.org/)

Those who have worked in the electric, increasingly electronic, lighting industry will appreciate [www.lamptech.co.uk/index.html](http://www.lamptech.co.uk/index.html), the online Museum of Electric Lamp Technology. James D. Hooker has drawn on his and others’ research and a global network of contributors to add to his site since 2002. It contains technical, biographical, and industrial documentation of lamps from the last 135 years. Recent updates include lamp histories and brochures as well as the histories of General Electric’s U.S. factories.

From Universidade Federal de Rio de Janeiro, in Portuguese (which can be translated online), comes a dissertation defended in February 2020 on the socio-technical evolution of electron tube technologies. Dr. Jose Mauro Kocher examines their

technical, social, and economic development and applications from the earliest human-made vacuums and electrical equipment to industrialization in the first half of the 20th century: [www.hcte.ufrj.br/docs/teses/2020/jose\\_mauro\\_kocher.pdf](http://www.hcte.ufrj.br/docs/teses/2020/jose_mauro_kocher.pdf)

Harry Lewis, Gordon McKay research professor of computer science at Harvard University, has written a thoughtful reflection on the men and women who taught, researched, and studied during the first ten years of the Aiken Computation Laboratory, 1966-1975. He stakes Harvard's claim to fundamental contributions to the new, ill-defined, fields of computer science and computer engineering: [www.harvardmagazine.com/2020/09/features-a-science-is-born](http://www.harvardmagazine.com/2020/09/features-a-science-is-born). Thanks to LM Dave Walden for forwarding this link.

Dave Walden has uploaded his and Eric Nickerson's *A Culture of Innovation: Insider Accounts of Computing and Life at BBN*, to the Engineering and Technology History Wiki: [https://ethw.org/Archives:BBN\\_computing\\_history:\\_A\\_Culture\\_of\\_Innovation](https://ethw.org/Archives:BBN_computing_history:_A_Culture_of_Innovation)

Outreach historian Alex Magoun has been requesting full access to Google Books that are in the public domain. One recently stood out from a series of World War II-era reports. The Summary of Principles of Sound Control in Airplanes was published by Harvard University's Cruft Memorial Laboratory, where Leo Beranek directed research on sound control. Last checked out from Stanford University's library in 1947, the eight-page report opens with "Denny was a WAR-BURDENED AIRCRAFT ENGINEER who had no time to study LONG-WINDED REPORTS. He wanted things FROM THE SHOULDER free from the floss and trimmings of mathematical and scientific lingo." See how Beranek's team responded to Denny's need: <https://bit.ly/3cYkz9m>

Dave Walden is best known as part of the Bolt Beranek & Newman team that created the first Internet protocols. Less widely recognized are his contributions to designing LaTeX.

## "JUICE" DOCUMENTARY

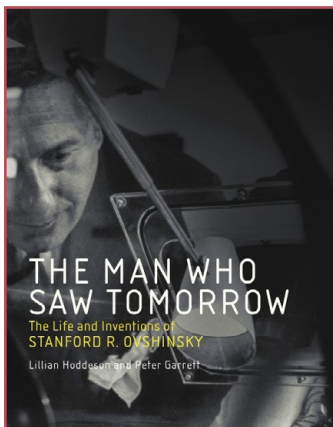
The book *A Question of Power* by Robert Bryce discusses the role of the availability of inexpensive electric power in regard to the economic development of nations. That in turn involves national policy, environmental issues, politically driven technology choices and impacts quality of life, the ability of the populace to seek higher education, the position of women and other issues.

The link below should provide all that you need for background. <https://www.politics-prose.com/book/9781610397490>

The documentary, "Juice," is a corollary work to the book. Joseph Cunningham, author of the IEEE History Center Press book *New York Power*, is in a short interview in regard to the development of electrification for mechanical power as opposed to lighting, and *New York Power* is noted on the banner line at the bottom of the screen.

## MIDDLETON BOOK PRIZE

### THE MAN WHO SAW TOMORROW WINS 2020 MIDDLETON PRIZE



The first full-length biography of a brilliant, self-taught inventor whose innovations in information and energy technology continue to shape our world has received the 2020 IEEE William and Joyce Middleton Electrical Engineering History Award from the IEEE History Committee.

In *The Man Who Saw Tomorrow*, Lillian Hoddeson and Peter Garrett tell the story of Stanford R. Ovshinsky, an unconventional genius who invented, among other things, the rechargeable nick-

el metal hydride batteries that have powered everything from portable electronics to hybrid cars, a system for mass-producing affordable thin-film solar panels and rewritable CDs and DVDs. "To combine strong scholarship with an appeal to a broader audience is exactly what we hoped to achieve, so to be recognized for fulfilling that double aim is especially gratifying," said the books' authors in their acceptance letter to the History Center.

The Middleton Award, established in 2014 by a gift from the estates of long-time IEEE leader William W. Middleton and his wife Joyce F. Middleton recognizes annually the author of a book (published within the previous three years) in the history of an IEEE-related technology that both exemplifies exceptional scholarship and reaches beyond academic communities toward a broad public audience. It carries a prize of US\$2,000.

genius who invented, among other things, the rechargeable nick-

## APPRECIATING LEWIS LATIMER

By Alexander Magoun, Rayvon Fouché, Robert Friedel,  
Paul Israel, and Leonard Reich



*Lewis Latimer*

A public statement in the United States recently raised questions about the history we teach and learn, in the context of common American perceptions about the invention of the incandescent light bulb.

The remarks and the fact-checkers' sources referred to the work of a truly remarkable, under-appreciated Black inventor, Lewis Latimer. Although he did not invent the light bulb, nor did he ever claim to, Latimer was a person of true accomplishment despite the prejudices

around him. He became adept at fields as disparate as mechanical drawing, inventing, entrepreneurship, applied engineering, expert testimony, and, ultimately, authorship about the electrical system he helped to create. Given the range of his abilities and achievements over a long career, this Black son of escaped slaves was an active and effective contributor to the second Industrial Revolution and well deserves his place in history classes.

Those who have delved more deeply into Latimer's life and work know that he did not invent the electric light. Latimer never even claimed to have made crucial improvements in the light bulb, and he would today be as shocked as anyone to hear someone credit him more than Thomas Edison. But none of that detracts from the genuine contributions Latimer did make—along with dozens of others—to shaping the technologies on which we still depend.

The history we teach should indeed include stories like Lewis Latimer's. In his teens, Latimer served in the Union Navy during the Civil War and subsequently took a menial job in a Boston patent law firm. Bright and motivated, he taught himself mechanical drawing. Seeing his talents, the firm hired Latimer as a draftsman for patent applications, where he worked on one of Alexander Graham Bell's telephone patents (he was never, as some state, "an assistant to Bell").

Even before the brief encounter with Bell, Latimer set his sights on being an inventor. His first patent was issued in 1874, and he earned others over the next two decades. He left his draftsman's job for one closer to New York, and from there was

hired by Hiram Maxim, one of Edison's most persistent rivals. By 1880, Maxim had already set up the United States Lighting Company—one of dozens of Edison competitors just as Edison's light had just been patented. Maxim soon recognized that Latimer's talents went well beyond mechanical drawing.

Latimer was a quick study in the booming field of electric lighting. He made useful contributions, patenting some of them. We should remember that this was one of the hottest technological fields of its day. It was like the personal computer or the internet in the last decades of the 20th century, and like those areas, was open to improvements in almost every direction. As in those fields, it was never obvious which improvements would turn out to be crucially important, which would be modest but appreciated additions to practice, and which would appear promising but be ultimately irrelevant to the technological trajectory. Most patents, then as now, fall into this last category, despite the hopes of inventors and backers. It is no criticism of Latimer's talents or initiative that his inventions in electric lighting were useful for a while, but not of lasting significance.

Latimer stayed with U.S. Lighting through 1881, before his employment at other aspiring lighting firms. In 1885 he began work for Thomas Edison's own electric light company. He stayed with this firm and some of its off-shoots for almost forty years, a valued and accomplished participant in the efforts to create and improve a revolutionary technology. Latimer's abilities were displayed in patent preparation, court testimonies, and in writing the first comprehensive book on the Edison system. He never saw himself as poorly used by Edison or his colleagues, although Latimer made it clear in his correspondence that he was sensitive to the slights and disadvantages of being Black in an increasingly segregated America.

Thus, although Lewis Latimer was not the "inventor of the light bulb" that some claim, he was an important contributor to the seminal field of electric light and power at a time when it was the primary driver of technological change and industrial growth.

### Further Reading

Janet M. Schneider and Bayla Singer, eds.; essays by Asa J. Davis, Kenneth R. Manning, and Bayla Singer, *Blueprint for Change: The Life and Times of Lewis H. Latimer* (1995): <http://edison.rutgers.edu/latimer/blueprint.htm>.

Rayvon Fouché, *Black Inventors in the Age of Segregation: Granville T. Woods, Lewis H. Latimer, and Shelby J. Davidson* (Johns Hopkins University Press, 2005).



## FELLOWSHIP AND INTERNSHIP SUPPORT FROM THE IEEE HISTORY CENTER

The IEEE History Center offers two programs of support annually for scholars pursuing the history of electrical engineering and computing: a visiting scholarship for an advanced undergraduate, graduate student, or recent Ph.D., and a dissertation fellowship for an advanced graduate student or recent Ph.D. The dissertation fellowship is funded by the IEEE Life Members Committee. The visiting scholarship requires residence at the IEEE History Center, in Piscataway, New Jersey, USA; there is no residency requirement for the dissertation fellowship.

### **The IEEE Life Member Fellowship in the History of Electrical and Computing Technology**

The IEEE Life Members Fellowship in the History of Electrical and Computing Technology 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 or her Ph.D. within the past three years. This award is supported by the IEEE Life Members Committee. The stipend is \$25,000 with a research budget of up to \$3,000.

Reimbursable research expenses include economy class travel to visit archives, libraries, historical sites, or academic conferences, either to hear papers or to present one's own work. Hotel stay, meals while travelling, copying costs, reprints of scholarly articles, and books directly pertaining to research are reimbursable. Any research trip expected to cost more than \$1,000 must be approved in advance by IEEE History Center Staff. Examples of non-reimbursable expenses include, but are not limited to: licensing fees for images for book version of thesis (book publisher should pay for those), computers or computer peripherals, digital cameras, clothing, and office supplies (paper, pens, printer cartridges, CDs, memory sticks, etc.).

Recipients are normally expected to take up the Fellowship in the July of the year that it is awarded. Fellowship checks are normally mailed to the Fellow quarterly in July, October, January, and April. For Fellows in the southern hemisphere who follow the southern hemisphere academic year, arrangements can be made to mail the checks in December (two quarters worth), March, and June.

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/about/history\\_center/fellowship.html](http://www.ieee.org/about/history_center/fellowship.html). The deadline for completed applications is 1 February. This completed application packet should be emailed to [ieee-history@ieee.org](mailto:ieee-history@ieee.org) or mailed to the Chair, IEEE Fellowship in the History of Electrical and Computing Technology Committee, IEEE History Center, 445 Hoes Lane, Piscataway NJ 08854. Applicants will be notified of the results by 1 June.

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

### **Elizabeth & Emerson Pugh Young Scholar in Residence**

(Note: It is hoped that the Covid-19 pandemic will no longer be disrupting travel plans by Summer of 2021, and that residency at the Center will be possible as described below. If travel is still being disrupted, the History Center will consider other arrangements, which may include study in place at a reduced stipend, or not offering the Pugh scholarship during the pandemic should that be necessary.)

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 the Elizabeth & Emerson Pugh Young Scholar in Residence at the Center's offices at the IEEE Operations Center, Piscataway, New Jersey, USA.

The residency 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 Young Scholar 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 residency is designed for those near the beginning or middle of their graduate careers, but advanced undergraduates, advanced graduates, and, on rare occasions, recent Ph.D.s 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 the United States.

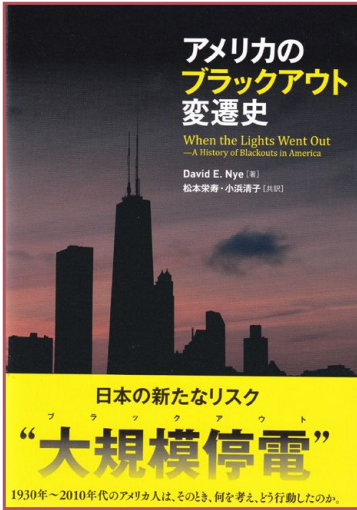
The stipend is US\$5,000, but additional funds may be available to defray travel costs, depending on the intern's circumstances.

There is no formal application form. To apply, please mail curriculum vitae showing your studies in electrical history, a three- to five-page page (single or double spaced) writing sample, 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.

IEEE is an AA/EO employer. Women and minorities are encouraged to apply for all positions. The IEEE History Cen-

ter is cosponsored by the Institute of Electrical and Electronics Engineers, Inc. (IEEE)—the world’s largest professional technical society—and Stevens Institute of Technology. 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, 445 Hoes Lane, Piscataway, NJ 08854, +1 732 562 5450, [ieee-history@ieee.org](mailto:ieee-history@ieee.org), [http://www.ieee.org/about/history\\_center/index.html](http://www.ieee.org/about/history_center/index.html).

## BIBLIOGRAPHY



NYE, DAVID,  
*Amerika no Burakkuauto Hensenshi*  
(*A History of Blackouts in America*),  
Ohmsha Publishing  
Co., Tokyo, 2020.

This is the Japanese edition of David Nye’s *When the Lights Went Out: A History of Blackouts in America*, translated by Eiju MATSUMOTO and Kiyoko KOHAMA.

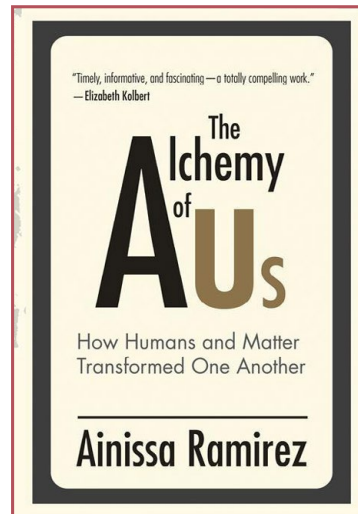
MATSUMOTO, EIJU, Research Associate, Smithsonian Institution. IEEE JCHAC Advisor.

Matsumoto learned about “When the Lights Went Out”, MIT Press, 2010, written by David E. Nye, in December 2010 when it was reviewed in the IEEE History Center Newsletter. And he became interested in blackouts. In 2011, Japan was hit by the Great Disaster in eastern Japan, accompanying large blackouts and also in 2018, Japan experienced the Great Earthquake in Hokkaido, northern part of Japan, and was affected by large power failures, too. Japanese people came to realize what were like power outages. All these phenomena contributed to the publication of his translation of Nye’s book into Japanese.

This book describes a variety of blackouts in the United States, examining the relationship between people and electricity. From the 1930s, when electricity became a part of everyday life, there have been many large power failures. The subject here is not simply power outages, but also understanding them in multiple ways; as a disruption of social experience, as a military tactic, as a crisis in the net-worked city, as the failure of an engineering system, and as the outcome of inconsistent political and economic decisions.

This is a socio-cultural history of American blackouts. The book uses several approaches from the humanities and the social sciences, to elucidate how people behaved at the critical moment, what caused the blackout or what was hidden behind it.

Available from Ohmsha Publishing Co., Kanda-Nishikicho 3-1, Chiyoda-ku, Tokyo, Japan. TEL: 03(3233)0641 // URL <https://www.ohmsha.co.jp>, 2800 \ ISBN 978-4-274-50743-4 C3054, 263 pp.



RAMIREZ, AINISSA,  
*The Alchemy of Us: How Humans and Matter Transformed One Another*,  
MIT Press, 2020.

By Alexander B. Magoun, Ph.D., Outreach Historian

Making unexpected links between one technological development and another is challenging because of the need to master the histories of disparate times, places, and technologies,

as well as the engineering of very different technologies and the science that goes into their operation. The details are often flawed and the contingencies of existence simplified to singular causes in the pursuit of a good story. The results, however, can encourage readers to step beyond comfortable assumptions about the ways things worked, and work, on people.

Dr. Ramirez, a materials scientist turned science evangelist, tempers our embrace of innovations that we presume are improvements. She wants to show how uses of certain materials—quartz crystals, steel rails, copper wires, celluloid film, carbon filaments, magnetic ferrites, scientific glass, and single-crystal germanium—have affected our habits, our bodies, and ourselves. To make her points, she researched relevant publications old and new, archives large and small, and the memories of diverse historical figures, dead and alive.

In the chapter entitled “See,” Ramirez begins with the bioluminescent firefly. Its numbers are declining around the world. Why? We go back nearly 150 years to William Wallace, who proudly

demonstrated his carbon arc light to Thomas Edison. He in turn found a practical way to “subdivide” it with a carbonized cotton filament for his light bulb. Citing contemporary scientists, Ramirez explains how artificial lighting has upset our circadian cycles as well as insect reproduction. Individuals, manufacturers, and municipalities are reducing, after sunset, either the quantity of light or the blue wavelengths that disrupts our endocrine systems.

Edison also appears in “Share,” which takes us from the Voyager Golden Records of 1977 to a century earlier when he first played back a sound recording. Ramirez then migrates to magnetic tape, which she assumes is digital, before focusing on Jacob Hagopian and IBM’s RAMAC digital magnetic storage disk in the 1950s. Unlike analog records, today’s streamed music gives our data back to whoever the distributors sell it. This conclusion overlaps with the final chapter, “Think,” which runs from the damaged brain of Phineas Gage to Gordon Teal’s creation of the single-crystal transistors that made electronic digital bits and their switching, brain-changing progeny possible.

Some connections are more persuasive than others, but Ramirez’s cautionary tales feature fascinating accounts of the people involved. Her annotated bibliography encourages further exploration.

Available from: MIT Press, Cambridge, Massachusetts, USA, 805-405-1619, <https://mitpress.mit.edu/books/alchemy-us>, US\$27.95 hardcover, ISBN 9780262043809 / US\$17.95 paperback, 9780262542265, 328 pp, index.

COOKE, GILMORE,  
*The Existential Joys of Fred Stark Pearson (1861-1915): Engineer, Entrepreneur, Envisioner*, Bowker, 2019.

Fred Stark Pearson (1861-1915) was an early AIEE member from New England. He was an innovator who built pioneer transit systems in Boston and New York as well as entire electric utility systems, generating plants, mining, and railroad systems, and more across three continents. Because of his tragic death, along with his beloved wife Mabel, on the *Lusitania* in 1915, his potential was only partially realized. A driven man, and a family man, Pearson’s good works – and great accomplishments – are finally brought back into focus through a biography of the man and the enterprises he created and shaped. The author, Gil Cooke, is a former member of the IEEE History Committee.

[https://www.amazon.com/dp/1733237801?ref\\_=pe\\_3052080\\_397514860](https://www.amazon.com/dp/1733237801?ref_=pe_3052080_397514860)

## NEW YORK POWER



Joseph J. Cunningham

## NEW YORK POWER

by Joseph J. Cunningham, published by the IEEE History Center

New York City’s density placed unique constraints on its electric light and power supply. Electrification began during the 1880s, but many innovations were required to supply urban service at a cost that would make possible large-scale consumption.

*New York Power* tells the story of the electrification of the one of the densest electrical load areas in the world, it was also where alternating current challenged and then ultimately vanquished the original direct-current system.

Author Joseph J. Cunningham has consulted a variety of historical sources to bring us the story of the massive and sustained effort to develop New York City’s electric utility system. He has researched and authored numerous articles and books on topics such as industrial electrification and electric rail transportation, and has taught widely on the history of electric power systems and consulted on numerous electro-technology projects and television productions. Lionel Trains has consulted him on the historical details of its model trains.

Available from

[http://www.amazon.com/New-York-Power-Joseph-Cunningham/dp/1484826515/ref=sr\\_1\\_1?s=books&ie=UTF8&qid=1383598253&sr=1-1&keywords=cunningham+new+york+power](http://www.amazon.com/New-York-Power-Joseph-Cunningham/dp/1484826515/ref=sr_1_1?s=books&ie=UTF8&qid=1383598253&sr=1-1&keywords=cunningham+new+york+power)  
in hard copy and on Kindle.

## BOOKS IN THE FIELD OF HISTORY OF TECHNOLOGY OF POSSIBLE INTEREST TO OUR READERS

As a service to our readers, the History Center Newsletter likes to draw our readers' attention to books published in our field.

*Regenerating Dixie: Electric Energy and the Modern South* by Casey Cater [https://www.amazon.com/Regenerating-Dixie-Electric-Pittsburgh-Environ-ebook/dp/B07SZK62H6/ref=sr\\_1\\_1](https://www.amazon.com/Regenerating-Dixie-Electric-Pittsburgh-Environ-ebook/dp/B07SZK62H6/ref=sr_1_1) (Casey Cater was the IEEE Life Members' Fellowship in Electrical History, 2014-2015)

*IBM: The Rise and Fall and Reinvention of a Global Icon* by James Cortada [https://www.amazon.com/IBM-Reinvention-Global-History-Computing/dp/0262039443/ref=sr\\_1\\_1](https://www.amazon.com/IBM-Reinvention-Global-History-Computing/dp/0262039443/ref=sr_1_1)

*A People's History of Computing in the United States* by Joy Rankin [https://www.amazon.com/Peoples-History-Computing-United-States/dp/0674970977/ref=sr\\_1\\_1](https://www.amazon.com/Peoples-History-Computing-United-States/dp/0674970977/ref=sr_1_1)

*The Train and the Telegraph: A Revisionist History* (Hagley Library Studies in Business, Technology, and Politics) by Benjamin Sidney and Michael Schwantes [https://www.amazon.com/Train-Telegraph-Revisionist-Business-Technology-ebook/dp/B07Q2FRKND/ref=sr\\_1\\_2](https://www.amazon.com/Train-Telegraph-Revisionist-Business-Technology-ebook/dp/B07Q2FRKND/ref=sr_1_2)

*News from Germany: The Competition to Control World Communications, 1900–1945* (Harvard Historical Studies) by Heidi J.S. Tworek [https://www.amazon.com/News-Germany-Competition-Communications-Historical/dp/067498840X/ref=sr\\_1\\_1](https://www.amazon.com/News-Germany-Competition-Communications-Historical/dp/067498840X/ref=sr_1_1)

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Your contributions to the IEEE History Center Fund preserve the heritage of the profession and its contributions to humanity. We invite you to find out more about the Center and its programs at [ieee.org/about/history-center/index.html](http://ieee.org/about/history-center/index.html) and more about the Engineering & Technology History Wiki ([www.ethw.org](http://www.ethw.org))



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