Center for the History of Electrical Engineering

Newsletter No. 35 Spring 1994

Center Publishes Radar History

The Center, in collaboration with the Deutsches Museum in Munich has just published *Tracking the History of Radar*, a volume of papers on the history and historiography of radar.

The essays in the volume, nineteen in number, describe the different periods of radar development in different countries, provide the military and political contexts for these developments, investigate the science-technology relationship in various institutional and cultural environments, and raise some historiographic questions by making use of numerous approaches to radar history.

Chapters of *Tracking the History of Radar*:

I Development of Radar Technology

1. Generations of radar
   John H. Bryant
2. On the development of radar technologies in Germany up to 1945
   Herbert Kümmritz
3. An overview of radar development from 1950 to 1990: time frame and some comments on developments in Germany
   Werner Gerlitzki
4. History of monopulse radar in the United States
   David K. Barton
5. Secondary surveillance radar — past, present and future
   Richard M. Trim

II Military and political contexts

6. Significant effects of radar on the Second World War
   Louis Brown
7. The military context of early American radar, 1930-1940
   David K. van Keuren
8. Strategic aspects of radar at sea
   Tony Devereux
9. Review concerning the history of German radar technology up to 1945
   Ulrich Kern

III Technology, Science, and Culture

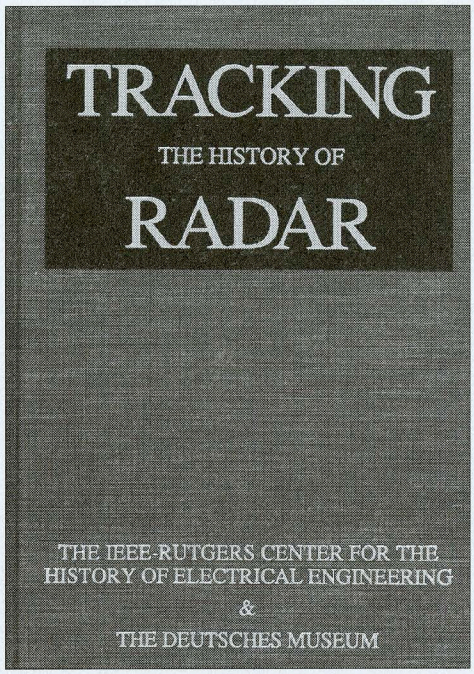
10. The significance of radio wave propagation studies in the evolution of radar
    Sean S. Swords
11. The contexts for the development of radar: a comparison of efforts in the United States and the United Kingdom in the 1930s
    Arthur L. Norberg and Robert W. Seidel
12. The development of electron tubes and of radar technology: the relationship of science and technology
    Walter Kaiser

IV Historiographical Problems

13. Radar as a case study in simultaneous invention
    Charles Süsskind
14. Some problems of radar systems historiography
    Hartmut Petzold
15. On strategic goals as perceptual filters: interwar responses to the military potential of radar in Germany, the UK and the US
    Alan Beyerchen
16. Echoes of the past: Henry Guerlac and radar's historiographic problem
    Michael A. Dennis

V Sources and Literature

17. The state of historical research in Great Britain
    John Becklake
18. Some unpublished U.S. sources for radar history
    Andrew Goldstein
19. An annotated bibliography of radar history
    Louis Brown



Tracking the History of Radar is available from the IEEE through normal product ordering proceedures (IEEE order # JP2593-2) or through the Center. The cost is $35 for non-IEEE members, $28 for members.

IEEE Foundation Makes Challenge Grant

We are pleased to announce that the IEEE Foundation General Fund, which has been a strong supporter of Center projects over the years, has generously provided the Center with a $50,000 challenge grant to help it with its capital campaign to raise a $2 million endowment by the year 2000. For every $2 dollars given by an individual or a non-IEEE organization between now and February 21, 1995, the Foundation will provide $1 in matching funds. With this matching support, your gift will have even more impact now.

You will find information and a donation form near the end of this newsletter. Please feel free to call William Aspray at (908) 932-1066 or e-mail to W.ASPRAY @IEEE.ORG if you have any questions about the Center, its programs, or its Friends Fund and Partnership Program. We really appreciate your support and it is essential to carrying out our program.

Flip to page 4 for information on how you can help

STAFF NOTES

New Book by Slotten

Cambridge University Press will publish a book by the Center's Postdoctoral Fellow, Hugh Richard Slotten, in May 1994. *Patronage, Practice, and the Culture of American Science: Alexander Dallas Bache and the United States Coast Survey* analyzes the activities of Alexander Dallas Bache—great grandson of Benjamin Franklin and the acknowledged "chief" of the American scientific community during the second third of the nineteenth century. Slotten pursues an analysis of Bache's superintendence of the U.S. Coast Survey—the most important scientific institution in antebellum America—that illuminates important themes in the institutional and cultural history of science in the United States. An article on the same subject published in *Isis* (the Journal of the History of Science Society) won the 1993 article prize from the Forum for the History of Science in America.

Archival Project Progress

In January, Center Research Historian Frederik Nebeker traveled to Massachusetts to conduct oral-history interviews as part of the Center's contribution to the study directed by the AIP Center for History of Physics on multi-institutional collaborations in science. Nebeker investigated the development of very broad band (VBB) seismographs and the founding of a company (Quanterra) to market them.

Nebeker Article on Estrin

Center Research Historian Frederik Nebeker has published another installment of his popular series of biographical articles on electrical engineers in the October 1993 issue of *Proceedings of the IEEE*. The article, entitled "Thelma Estrin, Biomedical Engineer: A Pioneer of Applied Computing", discusses Estrin's career in biomedical research and provides a role model for young female engineers.

Power Engineering Oral Histories

The Center, continuing its efforts to record on tape the memories of outstanding contributors to the electrical engineering profession, recently added several oral histories to its collection. Center staff attended the 1994 winter meeting of the Power Engineering Society held in New York City the week of January 31 and conducted formal interviews with six of the attendees. The engineers interviewed, John A. Casazza, John H. Chadwick, Charles Concordia, Andrew F. Corry, Harold N. Scherer, Jr., and Charles N. Wagner, each spoke between one and two hours on their careers in power engineering. The Center plans to have the tapes transcribed and edited so that its own staff, and other researchers in electrical history, can have easy access to them.

Cooper Speaks on Telegraph History

Research Assistant Jill Cooper presented a paper at MEPHISTOS '94, the 13th annual graduate student conference in the history, philosophy, and sociology of science, technology, and medicine, at Harvard University on February 26, 1994. Cooper's paper, entitled "Creating the Telegraph Operator Corps: A Comparative Study of 19th Century Telegraph Operator Training in Great Britain, France, and the United States," analyzed the impact that different social environments had on the development of telegraph technology.

New Display in Piscataway

The Center has contributed to the recent IEEE-wide effort to upgrade the Operations Center in Piscataway by installing a display of historic items in the building's front lobby. The display features IEEE memorabilia, such as the handwritten minutes of board of director meetings from the early years of the century, a gift presented to IEEE by Tau Beta Pi for the IEEE Centennial in 1984, and an assortment of IEEE medals and awards, including the Edison medal awarded to Elihu Thomson in 1909. These sit alongside several fascinating electrical artifacts such as a vintage radio, circa 1920, donated to the Center by Donald Fink; a crystal-detector radio, a maser component loaned by Charles Townes, a unique electric clock, and a nineteenth century telephone, supplied by AT&T. The exhibit also features cast busts of Alfred N. Goldsmith, one of the founders of the IRE, and American physicist Joseph Henry.

The Newsletter reports on the activities of the Center and on new resources and projects in electrical history. It is published three times each year by the Center for the History of Electrical Engineering.

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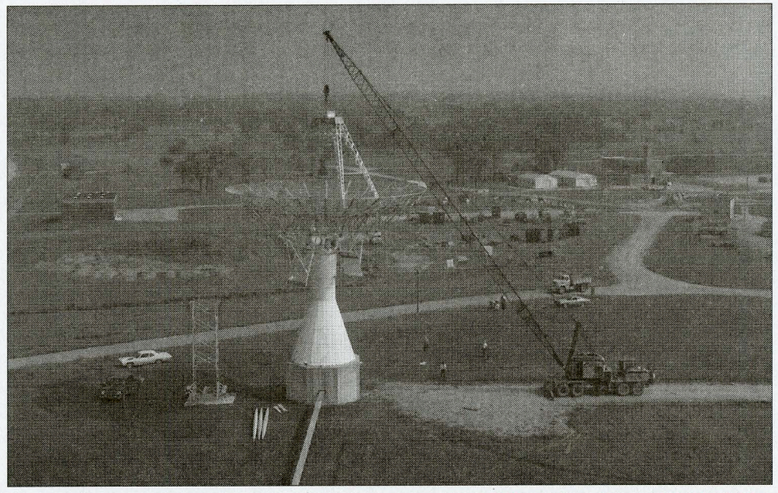
MILESTONES

ISIS Milestone

The IEEE Ottawa Section held a dedication ceremony at Shirley's Bay Research Centre on 13 May 1993 of an IEEE Electrical Engineering Milestone. The Milestone commemorates a Canadian satellite program, whose objective was to study the ionosphere. Four satellites—Alouette I, Alouette II, ISIS (International Satellite for Ionospheric Studies) I, and ISIS II—were launched in the period 1962 to 1971. The Alouette I was the first spacecraft built entirely by a country other than U.S.A. or U.S.S.R. A 60-foot antenna at Shirley's Bay (see illustration at right) was used to track the satellites. By 1990 more than 1000 papers and reports had been published from information collected by the Alouette-ISIS program. The Milestone plaque citation reads as follows:

Driven by the need to understand the characteristics of radio communication in Canada's North, Canadian researchers focused on the exploration of the earth's upper atmosphere, the ionosphere. Canada's satellite program commenced with the launch of Alouette-I on September 29, 1962. Alouette-II followed in 1965, ISIS-I in 1969, ISIS-II in 1971. The Alouette/ISIS tracking antenna serves as a reminder of Canada's contribution to this international effort in space science.



60' Kennedy antenna at Shirley's Bay

Talking Milestones...

A conversation with Charles R. Wright, member of the IEEE History Committee and Milestones Cooridnator

After a long career with the Public Service Company of Colorado, Charlie Wright is now busier than ever, giving much of his time to historical activities. Besides his work for the IEEE History Committee, he serves as Executive Director of the Georgetown Energy Museum, does historical writing and consulting, and chairs the IEEE Region 5 History Committee.

What is the Milestone program?
It's a program conducted by the IEEE History Committee through the Center for the History of Electrical Engineering to honor significant achievements in electrical, electronic, and computer engineering. After approval by the IEEE, a bronze plaque commemorating the achievement is placed at an appropriate site.

What is the purpose of the program?
Actually, there are several: to foster an awareness among electrical engineers of their professional history; to increase public understanding of EE; to encourage the preservation of historically important materials and sites; and to collect documentation of historical events and make the information widely available.

How does the program work?
An IEEE Section nominates an achievement and provides documentation of its historical significance. After the nomination is approved by both the IEEE History Committee and the IEEE Executive Committee, a plaque is cast and the Section conducts a dedication ceremony.

What value does this have for the Section?
The most important thing, I think, is increasing awareness, both by the Section members and the public at large, of local heritage. Also, the documentation of the achievement helps to separate fact from local myth, and the milestone process opens up channels of communication between the Section and other civic organizations, typically a local historical society.

I understand that in the last few years you and others have worked to bring about some changes in the Milestones program.
Yes, for one thing we've tried to involve Technical Societies, Society Chapters, and Student Branches—it is, after all, particular technical achievements we are honoring—in the nomination process. Another recent effort has been to make the program more completely transnational. Of the 25 Milestones that have been approved over the ten years or so of the program, only five are outside the United States. The next Milestone to be dedicated—the Poulsen arc-transmitter in May—will be located in Denmark, and it is likely that later this year a Milestone—the Yagi antenna—will be dedicated in Japan.

In the time you've served as Milestones Coordinator, what outstanding problems or successes have you had?
There have been some problems. The most frequent source of disappointment is that many worthy achievements are proposed as Milestones but do not get approved because interest flags among the volunteers at the Section before the process is completed. As for successes, I'm most pleased with the activity associated with the Transcontinental Telegraph Milestone. This came to involve, in a very positive way, many organizations including the University of Wyoming, the Pony Express Association, the Patee House Museum, the National Park Service, and Western Union, and we have since had other dealings with some of them.

Japanese Oral History Project

The Center and the History Committee of IEE Japan have agreed to collaborate on the Japanese Electrical Engineering Oral History Project. The result of the project will be approximately fifteen taped, transcribed, and edited interviews with distinguished Japanese electrical engineers and managers. The interviews will be conducted in English during 1994 by the Center's director, William Aspray. Japanese collaborators on the project are Dr. Yuzo Takahashi (Tokyo University of Agriculture & Technology), Mr. Masahiro Maejima (National Science Museum), Mr. Eiju Matsumoto (Yokogawa Technology Museum). Mr. Kazuya Watanabe (TEPCO Museum Project/Tokyo Power Electric Co.), Mr. Seiji Hayashida (Sony, Patent Division), Mr. Shuichi Tsukahara (National Research Institute of Education), Dr. Takehiko Hashimoto (University of Tokyo), Mr. Takuji Okamoto (University of Tokyo), and Mr. Yasushi Kakihara (University of Tokyo). Edited interview transcripts should be available in 1995.

Progress on Power and Control

The Center's Power and Control Project (described in two earlier newsletters, No. 31 and No. 33) has three components: the writing of a comprehensive history of electrical, electronic, and computer technology from the mid 19th century to the present; oral-history interviewing; and an archival program to identify important historical records and encourage their preservation.

The comprehensive history will appear in three volumes. Frederik Nebeker is at work on the volume covering the period from 1914 through 1945 and is currently researching the role of electrical technology in World War I. Loren Butler is at work on the volume covering the post World-War-II period, and is currently researching the development of electronic and computer technologies used in the home, at the office, and for entertainment.

In the first ten months of the project, 28 oral-history interviews have been conducted: Chester Smith, Nick Holonyak, Amos Joel, Karl Ulrich Stein, Robert Gallager, C. Chapin Cutler, John Moll, Leonard Thomas, J. Ross MacDonald, John V. Granger, Charles Flurscheim, Irving Stokes, John Whinnery, Eugene Whitney, Klaus Gueldenpfenning, George Stroke, Robert Chapuis, Hans Marco, Lee Kilgore, Meir Lehman, George Wilcox, and the six power engineers mentioned in the article on page 2 of this issue of the newsletter.

Progress has been made on several parts of the archival component of the project. Dr. Butler has written the text of a brochure to guide individual engineers in the evalution and deposition of personal records documenting their careers. This brochure, and an accompanying questionnaire, will be mailed to distinguished electrical engineers later this year. (A copy of the text is included as pullout in this newsletter. See next page.) The Center hopes to stimulate interest in the preservation of important records, and to collect information on the whereabouts of the records of significant members of the electrical engineering profession. John Riddle, Project Archivist, has been compiling names and addresses for the mailing of a similar brochure and a questionnaire to leading companies worldwide.

Foundation Challenge Grant--How You Can Help

- If you have not been a donor to the Friends Fund in the past, please consider giving as generously as you are able. Please remember that your contribution is tax deductible in the United States.
- If you have been a donor in the past, please consider making a larger donation during this limited time while the matching program is in force.
- If you are a long-time giver, consider becoming a Partner with a lifetime donation of $2500 or more. We will be pleased to credit all your past donations to the Friends program towards your Partnership donation.
- Recommend to your family and colleagues that they become supporters of the Center during this special time.
- Find out if your employer will match your donation. The company's donation as well as your own will be matched by the Foundation on the same 2-for-1 basis.
- Approach your company about making a corporate donation to the Friends Fund. Companies that make donations to the Partnership Program ($2500 or more) have their name appear on all the Center's publications. The company will thus receive a tax deduction and good publicity at the same time that it is being a good citizen.
- Approach your company about distributing the Center's fundraising literature to its employees, establishing the Center as one of its preferred charities, and offering matching support if it does not already do so. We will be happy to provide all the literature, work within the company's guidelines, and advertise in IEEE publications the company's special program to support us.
- If you are active in your IEEE Section, ask it to begin donating on an annual basis. (This support will not be matched by the Foundation's matching program, but its support is nonetheless very helpful.)
- If you are active in one or more IEEE Societies, encourage your Societies to contribute to the Center's endowment. (These funds will not be matched by the Foundation's matching program, but already the Societies have begun to play a major role in helping us to build our endowment. If you are willing to help in this way, it is important you contact Center Director William Aspray first, so that the request can be coordinated with the solicitation program already underway.)
- Consider making a bequest or establishing a charitable remainder trust with the Friends Fund as beneficiary.

Project Update

Center Materials on Internet

The Center is now providing various resources on the IEEE Gopher server, accessible from several major Gophers on the Internet (look for IEEE on the Gopher menu.) In the future, IEEE hopes to make its Gopher accessible directly via telnet.

The newsletter text will now be available electronically, as will a bibliography the Center has compiled of recent literature on the history of electrical technologies. Another feature will be transcripts of selected oral history interviews, along with a full list of all the interviews in the Center's collection. These resources will be gradually expanded as we learn more about how best to satisfy user needs.

For more information, e-mail the Center at IEEE@zodiac.rutgers.edu, or m.ellis@ieee.org.

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Enrich the Future by Preserving the Past

If our profession is to preserve its engineering heritage, learn from its past accomplishments and failures, and educate the world about its achievements, it is essential that we, as individual engineers, take responsibility to ensure that our documentary record is preserved. Archivists and historians will work with us, but it must be our responsibility not only to cooperate with them but also to initiate action to see that our records, artifacts, and memories are preserved for future generations.

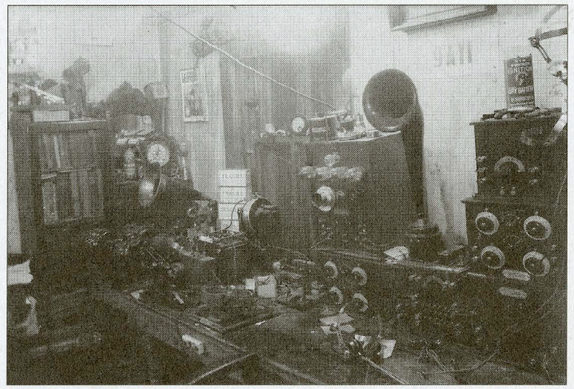
The time to preserve these records is now, before the records of the wonderful achievements of electrical engineers and computer scientists in the twentieth century are lost forever. The Center for the History of Electrical Engineering has prepared a pamphlet that presents some basic information to help you determine whether you have material worth saving, and what to do about it in case you do. We present the text of this pamphlet here in our newsletter as a special pull-out, easy to remove and save. If you would like a copy of the pamphlet, please contact the Center.

How do we determine whether our records are worth preserving?

If you have received a major award or other recognition from your colleagues, if you have been a principal participant in some major technical accomplishments, or if you have held key positions in management or professional societies, you should be thinking about saving your records. If you have served as the secretary for an organization or simply been a packrat, your materials might also be important to future generations of engineers and historians. The list of reasons to save an individual engineer's records, however, is far too large to enumerate, so the best idea is to consult an archivist, historian, or other person knowledgeable about records to determine whether your materials have lasting value.

Which records should be preserved?

This is a difficult question to answer. Archivists like to preserve records that document all aspects of an engineer's experience, from his or her student days throughout the professional career. Letters, notebooks, research notes, lectures, correspondence, funding proposals, project reports, organization charts, sales literature, technical manuals, patent applications, electronic records, blueprints, photographs, audio recordings, film, videos, and many other kinds of materials have lasting value. It is best for you not to make decisions about what to save, or even reorganize your materials before approaching an archivist about retaining your records. Rather, you should make these decisions in consultation with an archivist, who will probably be happy to go through your office files, basement, garage, or attic with you.



Wireless station 9AYI--photo from collection donated by Cecil Barrette

What kinds of repositories are interested in your records?

If you have worked for one organization for most of your career, especially a university, it may have an archive that would be interested in your records. Some local and regional historical societies and museums collect the records of individual engineers from their geographical area. In the United States, a few specialized repositories cater to aspects of our profession, such as the Charles Babbage

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Institute (computing), the Hagley Library (technological businesses in the Delaware Valley), and the Harvard University Baker Library (American business). The Library of Congress is interested in the records of America's most distinguished engineers and computer scientists. The IEEE and its predecessor societies. There are many other specialized libraries and archives around the country. And there are similar kinds of repositories in other countries.

GE building #60, Schenectady--photo from collection donated by William Ellenberger

IEEE Center for the History of Electrical Engineering accepts the institutional records of the

How does one find an appropriate repository?

To determine whether your collection would be of interest to a particular repository, you should contact the archivist by telephone or letter, briefly describing your career, the nature and extent of the materials you are offering, and your connections, if any, with that institution. Do not be too discouraged if the first facility you approach turns you down; budget and space constraints make great demands on archivists and repositories. Furthermore, each organization has a collecting mission of its own, and it will be most interested in accepting materials that best support its institutional goals. If you need assistance identifying leads to appropriate repositories, you might contact the Society for American Archivists or our staff at the IEEE Center for the History of Electrical Engineering.

What can be expected from a repository that accepts your materials?

When a collection of materials is donated and transferred to a repository, an archivist will appraise and process it for public use according to established standards and techniques. This will include refining the organization scheme, filing papers in acid-free folders and boxes for preservation, placing non-paper items in suitable containers, and writing a finding aid for the collection. Electronic records will also be evaluated and prepared for public access according to their special requirements. Often a short biographical essay will be written to accompany the finding aid, to help future researchers better understand the context of the materials deposited.

Overall, the goal of archival processing is to maximize access for researchers to the collection by taking necessary steps for its physical preservation, creating a coherent organizational scheme and providing an effectively written guide. Upon completion of processing, the collection will be opened for use by researchers. Your papers will then become a

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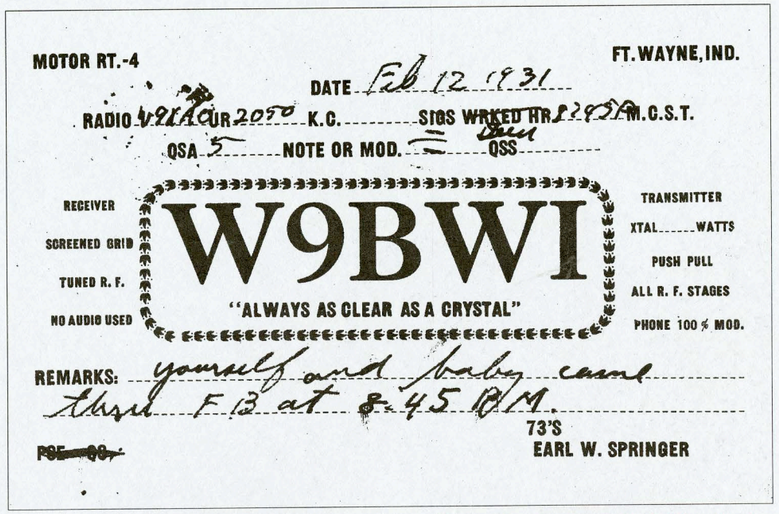
part of the permanent historical record of the electrical engineering profession.

What are the financial implications of donating records?

You should expect to negotiate with the repository about who will pay the cost of shipping your materials. You should not expect to receive payment for your collection, nor should the repository demand payment from you. Occasionally, there may be a tax write-off available for your donation. But an appraisal is required, which must be done by a disinterested and qualified third party, such as a certified appraiser; and often the appraisal cost is greater than the tax deduction. You may wish to consult with your lawyer or tax consultant about this matter. Most archives are not well financed, so you might consider the possibility of making a financial donation to accompany your record donation. This can help offset the substantial costs of processing and may bring your materials to researchers faster and more effectively.

What rights do I have to the materials after they are donated?

When you donate your materials, you will probably be asked to sign a document formally transferring the title, but not the copyright, to the repository. Once they have title, it is their right and responsibility to set policy about who should have access to the material under what conditions, so that the material is available to researchers but is not abused. Most repositories are willing to make arrangements to give special access to donors. If you think you will need frequent continuing use of your records, you might consider writing their donation into your will as a bequest after consulting with an archivist to determine their value for preservation.



From collection donated by William Parker

When will my records be made available to researchers and should I make any restrictions on access?

One question you might wish to raise is whether researchers will be given access to the collection before it has been completely processed and what the timetable for processing will be. Occasionally, there are sensitive materials that should be sealed for a period of time or otherwise restricted in access. Be aware that such restrictions can create significant management problems for archivists and should be avoided whenever possible.

Are there any other factors I should consider in donating my records?

You might think it is a good idea to divide your records up into different collections, each documenting a different part of your career, and donate each part to the most appropriate repository. However, the general consensus in the archival world is that it is better to

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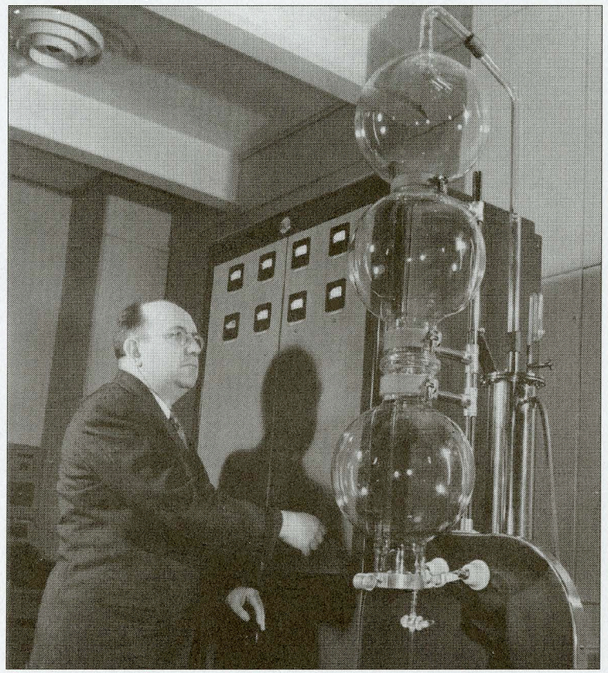
keep all your archival records together because the whole collection tells a richer story than the sum of its parts. You should not be too surprised if an archivist informs you may need to obtain the permission of others to donate some of the records in your collection. If, for example, you were employed by a company, you may not have the right to the disposition of the company's records that are with your personal papers. Archivists can guide you about what to do in this circumstance. They can also provide guidance about the disposition of artifacts in your possession, which are often segregated from, and preserved in a different way than, the paper records.



George Brown--photo part of collection donated by Edmund Laport

What do I do if I have more questions about the donation of my materials?

Please feel free to call the IEEE Center for the History of Electrical Engineering. We are happy to answer your questions about these matters, and since we are not likely to be the recipient of your collection (unless it includes institutional records of the IEEE or its predecessor organizations), we can act as a friendly but disinterested advisor in the placement of your materials. Below you will find some addresses and telephone numbers which might help you.

IEEE Center for the History of Electrical Engineering
Rutgers University
39 Union Street
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908-932-1066

Society of American Archivists
600 S. Federal
Suite 504
Chicago, IL 60605
312-922-0140

Charles Babbage Institute
University of Minnesota
103 Walter Library
Minneapolis, MN 55455
(612) 624-5050

Division of Electricity
National Museum of American History
Smithsonian Institution
Washington, DC 20560
(202) 357-1840

Historical Electronics Museum
PO Box 1693
MS 4610
Baltimore, MD 21203
410-765-2345

Hagley Museum and Library
Box 3630
Wilmington, DE 19807
302-658-2400

Baker Library
Harvard Business School
Soldiers Field Road
Boston, MA 02163
617-495-6395

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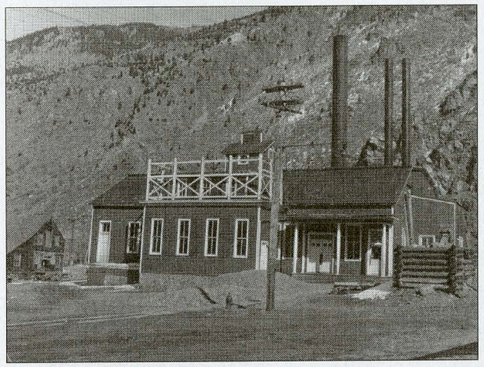
Correction--
We inadvertantly omitted the name of Edwin Pores from the list of our contributors which appeared recently in these pages. We apologize to Mr. Pores and thank all of our contributors for their support.

Georgetown

The Georgetown Energy Museum announces that it will open its doors in June 1994 for its second season. The museum, located at the hydroelectric generating station in Georgetown, Colorado, is a living museum which claims as its main attraction two functioning Pelton water wheel generators, both installed in 1906. In addition to the generators, other museum attractions include electrical artifacts, such as a wood-tank oil circuit breaker, a machine shop with belt driven equipment, and exhibits of photographs. The site is notable for being one of the earliest installations of the "Tesla," or multi-phase alternating current, electric power systems. For more information, contact Charles Wright, 720 Everett Street, Lakewood CO 80215.



Georgetown hydroelectric plant, ca.1916

The Dawn of Sound

The first commercially successful sound motion picture,Warner Bros.' *Don Juan*, premiered in New York on August 6,1926. Within three years, all Hollywood studios had switched from silent to sound films, and thousands of theaters had installed sound equipment. "The Dawn of Sound," a traveling museum exhibit, explains the invention, innovation, and adoption of this new technology. The technological system that made this transition possible was developed at AT&T Bell Laboratories and its predecessor, the Western Electric Engineering Department. Sheldon Hochheiser, Historian at the AT&T Archives, is curator of the exhibit which was underwritten by AT&T. The exhibit includes three display cases of artifacts and illustrations documenting the invention, innovation, and diffusion of this technology; an interactive video unit giving additional context on general, technological, and film history; a 1927 AT&T Western Electric sound film projector system; and a 1929 sound newsreel camera. The exhibit will be at the Lee Discovery Center, Las Vegas, Nevada from May through August, and the Museum of Arts & Sciences in Macon, Georgia from September through November. Additional bookings are expected into 1995. For further information, contact Dr. Sheldon Hochheiser at the AT&T Archives, PO Box 4647, Warren NJ 07059.

French Fellowships

The Centre de Recherche en Histoire des Sciences et des Techniques announces it is offering two or three research positions at the Centre National de la Recherche Scientifique in Paris for 1995. Candidates should have a doctorate in the history of science or technology (or closely related field.) A good command of the French language is required. Applications are encouraged from younger scholars whose projects fall within on of the Centre's main areas of research: the history of the relationship between science, technology, and industry; the history of the spread of scientific and technical knowledge and practices, including the history of popularization; and the history of the interaction of France with other countries in the fields of science and technology. Work at the Centre is interdisciplinary, with a strong emphasis on comparative studies. Research resources include the specialized libraries and other facilities of the Cité des Sciences et de L'Industrie. Appointments can be made for periods less than one full year. All appointments require a working permit issued by the French authorities. The monthly stipend is approximately 13,000 Francs. Application deadline is April 30, 1994. Letters of application, accompanied by a complete curriculum vitae, a list of publications, a brief statement of the proposed research (in French) and two letters of recommendation should be sent to Dominique Pestre, C.R.H.S.T., Cité des Sciences et de L'Industrie, 75930 Paris Cedex 19, France, tel. 40 05 75 52, fax 40 05 79 21.

briefs...

- In an event commemorating the lifelong scientific contribution of 60-year New York resident Nikola Tesla, the corner of 40th street and Avenue of the Americas in New York City was dedicated Nikola Tesla Corner on February 26.

- The Tesla Memorial Society has released a video documentary on the life of Michael Pupin. The video is available for $24.95 from the Tesla Memorial Society, 453 Martin Road, Lackawanna NY 14218.

Multimedia Used to Teach History of Technology

Julian Reitman, a member of the History Department at the University of Connecticut-Stamford, has been experimenting with using a multimedia environment to aid learning about technology's impact on society and how it has evolved. In a year-end report summarizing the project experiences in 1993, Reitman outlines the features of the system and the methodology of its use, giving also a sketch of the curriculum and discussion of the availability of appropriate software. He notes that although the time required to prepare multimedia-enhanced lectures was as much as four to five times that of conventional lectures, the student response was very positive. For more information, contact Julian Reitman, Department of History, The University of Connecticut, Scofieldtown Road, Stamford CT 06903, tel. (203) 322-3466 ext 207, email: reitman@uconnvm.uconn.edu.

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Legacies

"MIRAN, which stood for Missile Ranging and Navigation, was one of the two major ground tracking systems on the range at the time. It had been developed by Oklahoma A&M and delivered to the range in a supposedly 'operational' state. But operational in those days didn't mean what it does today. The system was built around a 2-GEDA computer. This had what seemed like a zillion racks and ten zillion vacuum tubes, mechanical resolvers, and all the other devices of the day, which either didn't work or required constant attention and calibration.

"And what did this equipment do? It solved a simple set of simultaneous equations with three variables from six possible radar range sources. The computer ran at the fabulous rate (in those days, 1954) of 10 kilohertz. One could do more with a $69.65 hand-held programmable calculator today...but no one could have been more proud of our achievements considering the state of the art."

--Marvin Udevitz

This excerpt is just one of hundreds of stories, explanations and anecdotes being published in the book *Legacies*. The book is a compilation of memoir highlights, all written by IEEE life members, covering experiences that took place between the early 1900s through the 1980s. Chapter titles include: Education, Military, Getting Started, Dilemmas, Retirement, along with, of course, Jobs and Career Paths Taken.

The IEEE Life Members Committee, which is sponsoring this project under the direction of Past Chair Robert Lawrence, will begin selling *Legacies* this summer. Soft cover, with over 200 pages, the book will cost $6(US) to Life Members, $15 to other IEEE members, and $20 for everyone else. These prices include shipping and handling costs. For more information, call 1-800 678-IEEE.

Partnership Program

We are grateful to the organizations and individuals listed below who provide generous support to the center in the form of operating, endowment, and project funding. If you or your organization are interested in joining our Partnership Program, please contact the Director, Dr. William Aspray.

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We are also grateful to the thousands of individuals and institutions who make annual contributions to our Friends Fund.

Telecommuncations History

The Second International Symposium on Telecommunications History will be held at Pine Manor College, in Brookline, Massachusetts on August 5-6, 1994. The symposium will include papers on topics such as telecommunications inventions, telephone engineering, biographies of telephone pioneers, economics, finance, competition, regulation, legal conflicts, manufacturing and operating companies, local and regional telephone histories, archives and museums and other sources of historical material, telephony's artifacts and antiquarian literature, and the sociological aspects of the telephone. The keynote speaker will be Robert V. Bruce, the Pulitzer-prize winning author of *Bell: Alexander Graham Bell and the Conquest of Solitude*. The registration fee is $100 per person, which includes a reception/cocktail hour Friday before dinner, refreshments during breaks, and the concluding banquet. The symposium is being sponsored by the American Studies department of Pine Manor College, Telephone Pioneers of America, and Telephone Collectors International, Inc. For more information, contact George Howard, 5762 Innsbruck Road, East Syracuse, NY 13057-3059, fax (315) 656-9975.

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