Center for the History of Electrical Engineering

Newsletter No. 41 Spring 1996

Center Receives Endowment

We are delighted to announce a major financial breakthrough for the Center. The IEEE, the IEEE Foundation, and the Friends Committee have generously joined together to create a fund of more than $2.7 million, which will be treated like an endowment to support a significant portion of the Center's operating expenses, beginning in 1997. The IEEE has donated $1.25 million, the IEEE Foundation $1.0 million, and the Friends Committee essentially all of its funds (approximately $500,000).

The process began when 1994 IEEE President Troy Nagle established a Blue Ribbon Committee to review a request to use IEEE reserve funds for a history center quasi-endowment. The Blue Ribbon Committee, chaired by Theodore Hissey and including Henry Bachman, Wallace Behnke, Bruce Eisenstein, Thomas Rhyne, and Chester Taylor, endorsed the idea, and their recommendation was accepted by the IEEE Executive Committee. 1995 IEEE President Thomas Cain continued the effort begun by his predecessor and saw it through to fruition. Meanwhile, with shaping guidance from its President Henry Bachman and Treasurer Eric Herz, the IEEE Foundation voted to provide $1 million from its unrestricted funds to serve as a quasi-endowment to replace the series of project grants it had provided to the Center in the past. Under the Chairmanships of Emerson Pugh and then Eric Herz, the Friends Committee decided to provide not only $250,000, as requested in the proposal, but virtually all of its existing resources, other than a small operating budget for the current fiscal year.

In addition to the quasi-endowment fund, each of these three organizations continues to financially support the Center in other ways. The IEEE has ongoing financial responsibility for the Center and will continue to provide operational funding; the IEEE Foundation has agreed to entertain occasionally certain kinds of project funding requests that are consistent with its newly implemented strategic plan; and the Friends Committee is increasing its annual support for such projects as the Power and Control project and the Center's newsletter. Other regular sources of funding, such as Rutgers and the Life Member Committee, are not affected by the new endowment.

This support is of great value to the Center. It provides a base level of support for a continuation and expansion of the Center's activities. It allows us to plan programs and staffing more rationally. It helps us to maintain the priorities of the IEEE membership instead of those of external funding sources. The funding is a demonstration of commitment from the IEEE that it is interested in supporting the Center over the long term, which will make it considerably easier to attract funding from external donors.

The major condition placed on the grant from the IEEE was the submission of an acceptable five-year business plan for the Center. Under this plan, the Friends Committee, with support from the Center staff, will work to leverage these initial donations from the three IEEE organizations and attract support from external institutions and individuals in order to build up the endowment.

We are most grateful to these three organizations for their generous support and to the many volunteers and staff who worked to make the endowment a reality.

How You Can Help

The IEEE and the IEEE Foundation hope that you will join with them in building up the endowment to support the activities of the history center. This support is critical if the Center is to be able to continue its activities and build upon them to serve you better. If you have any questions about any of the suggestions below, please feel free to contact the Center Director, William Aspray (contact info on page 2).

- 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 contributions are tax-deductible in the United States.

- If you have been a donor in the past, please consider donating at a higher level while we are building our endowment.

- If you are a long-time giver, please consider becoming a Partner with a lifetime gift of $2500 or more. Pledges to the Partnership Program can be fulfilled over a five-year period, and we can arrange to credit past contributions towards your pledge.

- Recommend to your family and colleagues that they become supporters of the Center during this special time.

- Ask your employer to match your contribution.

- Ask your IEEE Society to join the seven Societies that have already signed up to the Partnership Program.

- 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 they are helping us out.

- Approach your company about distributing the Center's fundraising litera-

Continued on page 12

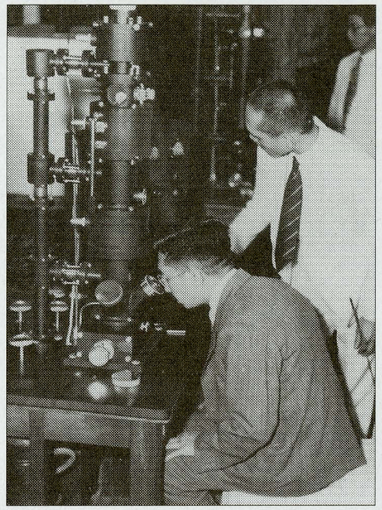
STAFF NOTES

Internet History

Janet Abbate will publish a paper entitled " 'Open Systems' and the Internet" in a forthcoming issue of the journal *The Information Society* that will be devoted to the history of the Internet. Abbate will be traveling to Manchester, England next month to research the early history of British computer networks at the National Archive for the History of Computing.

Nebeker on Townes

At the invitation of the editors of *Engineering Science and Education Journal* (a publication of the British Institution of Electrical Engineers), Nebeker wrote an article entitled "Charles Townes, the maser, and the relationship between engineering and science," which appeared in the December 1995 issue of that journal.



Emperor Hirohito examining JEOL electron microscope

Electron Microscope

William Aspray has published an article entitled "Japan's Commercial Development of the Electron Microscope" in the January 1996 issue of *IEEE Engineering in Medicine and Biology Magazine*. The article focuses on the origins of the company and on the business factors that has enabled one Japanese company, JEOL, to become a world leader in this field. The article is based partly on an interview that Aspray conducted with Kazuo Ito and Kenji Kazato, two of the principals involved in JEOL.

Who to Contact

Here are appropriate contacts on the Center staff for some of most popular programs and frequent activities:

General Information	Nichole Brownlee
Order Center Products	Nichole Brownlee
Reference queries	Andrew Goldstein
Archives	Andrew Goldstein
Milestones (historic site designation)	Frederik Nebeker
Oral history	David Morton
Exhibits	Andrew Goldstein
Newsletter	Nichole Brownlee
New Program Initiatives	William Aspray
Partnership Program	William Aspray
Routine administrative matters	Nichole Brownlee
History of IEEE Technologies (formerly Power and Control)	Frederik Nebeker
Lemelson Project on Microelectronics	David Morton
Semiconductor History Project	Andrew Goldstein

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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e-mail: history@ieee.org
http://www.ieee.org/history-center

1996 IEEE Summer History Conference

The Center is sponsoring a summer conference on the history of computing on June 13-16, 1996 in Calgary, Alberta, Canada. The conference is one of the Center's activities for 1996 organized in celebration of the fiftieth anniversary of the computer and of the Computer Society. Anyone interested in the history of computing is welcome to participate.

June 13 — Invited lectures by distinguished historians of computing from Europe and North America

June 14 — 20- to 30-minute talks by attendees (If you wish to present a talk, please send a title, one-paragraph abstract, and one-paragraph biography no later than May 1.)

June 15 — Bus trip to Banff and Lake Louise

June 16 — Workshop for engineers and computer scientists on historical methods - taught by leading historians and archivists (obtaining and using archives effectively, oral history techniques, contextualizing history, etc.)

Following the center's tradition for summer conferences, dress and format will be kept informal, ample time will be set aside for discussion, the conference is set in a vacation area (Rocky Mountains) to encourage people to bring families, there will be social events, and costs will be kept low.

Housing will be available at the University of Calgary in apartment-like suites with single and double bedrooms, with living rooms and bathrooms shared by one to four bedrooms. Final prices are not yet available, but they will range from Can$25-45/night. Regular hotel accommodations can also be booked near the airport, in downtown Calgary, or adjacent to the university. Rates vary, but are higher than the university suites.

The conference fee for full-time employed individuals is US$50 and for students, retired, and unemployed individuals, the fee is US$15. (As a gesture of friendship to our Canadian colleagues, we will accept the conference fee in Canadian or US dollars—at par.) This fee includes the bus fare to Banff and Lake Louise, access to meeting rooms, and refreshments.

A number of Canadian, U.S., and other airlines have regularly scheduled service into Calgary airport. Ground transportation to the university from the airport is straightforward and inexpensive. There is also regular rail and bus service into Calgary.

The meeting agenda should be available by mid-May. We will advise people if their paper has been accepted for the program as early as possible, but no later than mid-May. No funds need be paid in advance, but it would be a great convenience to the organizers if you could return your registration form by May 1. Registration for the conference may be available after May 1, but this cannot be guaranteed.

We thank the IEEE Foundation for its financial support and the IEEE Computer Society for its cooperation in organizing the conference.

Registration form, IEEE History of Computing Conference
Calgary, Alberta, Canada, June 13-16, 1996

Return form to: IEEE-CHEE, 39 Union St., Rutgers University, New Brunswick, NJ 08903.

Name _____ Affiliation _____

Address _____

_____

Telephone _____ Fax _____ E-mail _____

Number of adults _____ children _____ in your party.

Special needs(dietary, slide projector, etc.) _____

Title of proposed paper (if any) _____

_____

Paper abstract:

Brief biography (if proposing paper):

CENTER NEWS

IEEE-IEEJ Meeting

On December 7 and 8, 1995, seventeen representatives of the IEEE and the IEE Japan met on the island of Maui in the Hawaiian Islands to discuss the history of electrical engineering. The two groups were led by the respective chairmen of the two organizations' history committees, Tsuneo Mitsui and Michael Williams. Short papers were followed by lengthy discussions focused on the historical programs of the two organizations, existing historical scholarship on Japanese and U.S. electrical technologies, and historical methodologies. The meeting concluded with a discussion of various ways in which the two organizations could cooperate in the future. A joint Maui declaration was approved, and both organizations agreed to consider holding another Maui meeting in a year or two. We wish to thank our colleagues in the IEEJ for taking the initiative to propose this important conference and for underwriting much of the cost. In particular, we wish to thank Yuji Okita of Toshiba for his dedicated organizational work.

William Aspray, Michael Williams, Tsuneo Mitsui, Fumio Arakawa at IEEE-IEEJ Maui conference

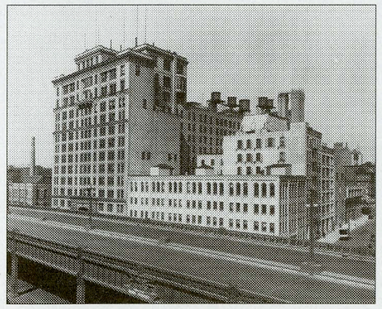
Rutgers Teaching

As a part of the agreement between Rutgers and IEEE, and as a good way to reach the public, members of the Center teach history courses each year on the New Brunswick campus of Rutgers. In the fall semester of the 1995-96 academic year, William Aspray taught a graduate course surveying major topics in nineteenth and twentieth century technology, while David Morton led all the Center's historians in team-teaching an undergraduate survey course on the history of American science. In the spring semester, Janet Abbate is teaching a seminar for undergraduate history majors on the history of women and technology, while Rik Nebeker is teaching a undergraduate lecture course on the history of American technology.

Continuing Work on Oral History Collection

The Center holds more than 270 oral history interviews with distinguished electrical engineers, computer scientists, and managers in the electrical, electronics, and computing fields. With generous support from several organizations, the Center has and will continue to be able to develop this valuable resource.

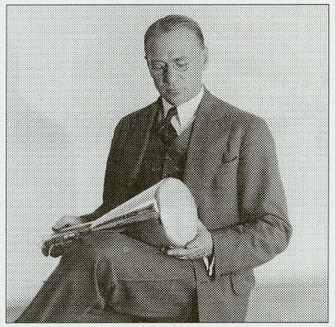
During the past two years, with support from the IEEE Life Member Committee, the Center has been preserving, transcribing, and editing all the interviews inherited by the Center when it was founded in 1980. We are pleased to announce that this project has now been completed, and forty-five interviews are now available free of charge on the Center's home page on the World Wide Web (http://www.ieee.org/history_center). Interviews are available from the Center in printed form for a charge. There are a series of interviews concerning RCA, Bell Laboratories, and Frederick Terman and associates, as well as miscellaneous interviews on many aspects of electrical, electronic, and computing technologies.



Bell Laboratories facility in Manhattan. Site of work of many of the individuals in the IEEE Oral History interviews now available on our Web site.

For the past several years, the Center has had a large grant from the Andrew Mellon Foundation, one use of which is to further the international nature of our oral history collection by concentrating on interviews outside the United States. Center staff have already conducted more than thirty interviews under the auspices of this grant, and work is underway to get these interviews into final form and make them available on the Web site. This summer several members of the staff will conduct interviews in Europe. (Suggestions of people to interview are always welcome.) During the spring and fall, interview trips to Asia are planned. Other regions of the world will be covered in 1997.

A recent grant from the IEEE Foundation will allow us to process and place on the Web a group of nineteen interviews conducted during 1994 in Japan, as well as a group of interviews conducted over the past five years in the United States. The latter include a number of interviews with power engineers and with former IEEE presidents.



Vladimir Zworykin holding a CRT that he developed. An interview with Zworykin is available on our Web site.

For more information about any of these interviews, contact David Morton, the Center's coordinator for oral history. Historians or engineers outside the United States who would like to help the Center staff organize interview trips to their country should contact Dr. Morton.

CENTER NEWS

IEEE Foundation Grant

We are pleased to report a generous grant from the IEEE Foundation. The grant provides additional support for our ongoing project to write a three-volume history of electrical, electronic, and computing technologies; continuing support for our oral history program (in particular for the processing of a number of interviews with U.S. and Japanese engineers and computer scientists); and a subsidy for a summer conference on the history of computing. The Foundation made possible the writing project in the first place by providing the initial funding, which we have leveraged to gain support from four other sources. The oral history program is one of the center's most popular programs, and this grant will enable us to make more interviews available free of charge over the Internet. The summer conference is one of the activities the center is undertaking to help celebrate the 50th anniversary of the computer. (See the article in this issue about the summer conference.)

Manufacturer of power electronic chips. This is one of the areas of innovation being studied in the Centers joint project with the Lemelson center.

Innovation in Microelectronics

In 1996 the History Center began a collaborative project in conjunction with the Lemelson Center for the Study of Invention and Innovation, located in Washington D.C. at the National Museum of American History (a part of the Smithsonian Institution). The Lemelson Center was founded in 1995 to promote the study of innovation and invention and disseminate its findings to the public. As part of that activity, Lemelson researchers at the Smithsonian are investigating the use of interviews to collect data from successful inventors in the field of microelectronics. Because of our experience in oral history field work and expertise in electrical history, the History Center was a natural choice for a partner. During 1996, History Center staff will conduct a series of interviews with microelectronics pioneers and inventors. The first such interview was undertaken by staff research historian David Morton in January.

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The Newsletter's *"Bibliography" section was prepared with the assistance of Prof. Thomas J. Higgins of the University of Wisconsin-Madison.*

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Book Review:

Ernst Feldtkeller and Herbert Goetzeler, eds. *Pioniere der Wissenschaft bei Siemens: Beruflicher Werdegang und wichtigste Ergebnisse* [Pioneers of Science at Siemens: Professional Develepment and Most Important Achievements]. Erlangen: Publicis MCD Verlag, 1994. 187 pp.

This book contains, in concentrated form, accounts of the careers of 27 engineers and scientists who were employed, at least for a time, by Siemens. For each one there is a professional chronology (listing positions held and the work done), several illustrations (including a portrait photo), a chronology of awards and honors, a list of most important publications and patents, and a list of sources of information about the person. Most of these engineers and scientists contributed to the development of electrical technologies. A few are well known: Werner von Siemens, who started the Siemens companies; Walter Schottky, famous for his studies of electron tubes; and Dennis Gabor, inventor of holography. Others, including Reinhold Rüdenberg (who brought electromagnetic theory effectively to bear on the design of electrical machines) and Karl Küpfmüller (who helped establish control theory as a discipline), deserve to be. And all made important contributions. Historians of technology will be grateful for this meticulous collection of useful information.

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MEETINGS

Telephone

The Independent Telephone Historical Foundation, Inc., the Telecommunications History Group, Inc., and the Telephone Collectors International, Inc. are sponsoring the Fourth International Symposium on Telecommunications History in Denver, Colorado on June 19-20, 1996. The emphasis will be on telephony, with papers by academics, graduate students, professionals in the telecommunications industry, and others. For further information, contact Herbert J. Hackenberg, Executive Director, Telecommunications History Group, Inc., P.O. Box 8719, Denver, CO 80201-8719; telephone 1-303-296-1221; fax 1-303-730-3647.

Sonar

The Centre for the History of Defence Electronics will be holding a colloquium on the history of Sonar at Bournemouth University September 19-20, 1996. For further information, please contact Katherine Barker, Continuing Education Office, School of Conservation Sciences, Bournemouth University, Poole, United Kingdom BH12 5BB; telephone 44-01202-595273; fax 44-01202-595255.

Radar

The Fourth WW2 Air Forces Radar Reunion will be held in Blackpool, United Kingdom May 17-20, 1996. For booking information contact the Norbreck Castle Hotel, Queens Promenade, Blackpool, Lancashire FY2 9AA, United Kingdom; telephone 44-01253-352341; fax 44-01253-356833.

ICOHTEC

The International Committee for the History of Technology (ICOHTEC) will hold its annual meeting in Budapest, Hungary from 7-11 August 1996. Center director William Aspray will be speaking on John von Neumann in a symposium entitled "The Hungarian Connection: From the Manhattan Project to Star Wars" organized by Sybil Francis and Barton Hacker. For more information contact Barton Hacker at L-451, LLNL, P.O. Box 808, Liermore, CA 94551; telephone 1-510-422-7327; fax 1-510-422-2302; e-mail hacker1@llnl.gov

SHOT-96

The annual meeting of the Society for the History of Technology is being held August 1-4, 1996, in London. Some of the sessions planned include: Birth of radar; Computing and technology policy: international perspectives; Early electronics: engineering science and engineering practice; Heating cities effectively: the fortunes of cogeneration and district heating; Information technology and the transformation of management; Innovation and modern technologies; Lighting; Research engineers and bureaucrats: a marriage made in heaven or hell; Technological transfer in the 20th century; Technologies of control and control of technologies: international perspectives; The consumer and light, heat, and power technology in western society; University, industry, and government: directing the postwar visions of computing. There will also be to various museums and historic technological sites around England.

For registration information, contact the conference service: IBC Executive Travel Ltd., 105 Walton Road, East Molesey, Surrey KT8 0DR, United Kingdom; telephone 44-181-941-5400; fax 44-181-979-0953.

Edison lights installed in late 19th century French railway station.

Edison at 150

In recognition of the 150th anniversary of Thomas A. Edison's birth, the National Park Service, Edison National Historic Site, and the Organization of American Historians will co-sponsor an international conference, entitled Interpreting Edison, to be held 25-27 June 1997 in Newark, New Jersey and at the Edison site in West Orange, New Jersey. The conference will convene educators, museum curators, interpreters, and scholars from a variety of disciplines, as well as the general public, for a critical examination of Edison's impact on innovation, manufacturing, business, and popular culture. The conference also will explore Edison's role as inventor, entrepreneur, and cultural figure; the role of Edison's laboratories in Newark, Menlo Park, West Orange, and Fort Myers in the development of technology and science; and the role of the National Park Service and other agencies in preserving and interpreting the Edison story. Edison NHS plans to publish selections from the conference proceedings. Proposals for individual papers or panels on any of these or related historical and cultural themes should be submitted by 31 July 1996. Send proposals and a brief biography to Leonard DeGraaf, Edison National Historic Site, Main Street and Lakeside Avenue, West Orange, New Jersey 07052; telephone 1-201-736-0550, extension 22; e-mail edis_curatorial@ nps.gov

HISTORICAL INSTITUTIONS

British Computing Archives

Computing, in its many ramifications, is central to technological and social change in the late 20th century. Britain has played a major role in this technology. Yet although many of the pioneers are still accessible, the artefacts and the historical records are fast disappearing. Aware of this fact, in 1985, a committee of industrialists, computer scientists and historians collaborated to set up the National Archive for the History of Computing at Manchester University.

The importance of Manchester and its region in the history of British computing is well known. It was at Manchester University that the Mark I, the world's first electronic stored-program computer, operated in 1948. Moreover, the Manchester region remains an important centre for the British computer industry, and the University itself has continuing strengths in computer science.

The policy of the NAHC is to:

- produce a comprehensive listing of records relating to the history of computing in Britain and encourage their preservation
- find secure homes, in the Archive of elsewhere, for such records as are at risk
- conduct and record interviews with leading figures in the history of computing to establish an oral history archive
- undertake research into computer history and stimulate research by organizing conferences and postgraduate teaching and supervision

Collections held at the National Archive for the History of Computing include:

- the NAHC pictorial collection; over 8000 images of British computers and information technologies
- the ICL historical collection
- the computing papers of the National Research Development Corporation, an important organization set up in 1949 to encourage British innovation
- the records of Manchester University computer science, from the Mark I onwards
- Open Systems Interconnection standardization archives
- rare films and oral history recordings
- documentary records relating to important figures and institutions in the history of British information processing, including:
  - United Kingdom Atomic Energy Authority
  - Cambridge University Computer Laboratory
  - English Electric Company Limited
  - Ferranti Limited
  - Douglas Hartree
  - Meteorological Office
  - National Physical Laboratory
  - Scientific Computing Service Limited
  - Alan Turing

Details of catalogued material can be found on the Internet:

http://www.man.ac.uk/Science_Engineering/CHSTM/

For further information, contact Jon Agar, Associate Archivist, Centre for the History of Science, Technology and Medicine, Mathematics Tower, Manchester University, Oxford Road, Manchester M13 9PL, UK; phone: (0161) 275-5845; fax: (0161) 275-5699; e-mail: agar@fs4.ma.man.ac.uk

Yagi-Uda milesteone dedication. Jonathon Coopersmith, Takashi Sugiyama, Yuzo Takahashi, and Eiju Matsumoto.

German Communication Technologies

Some of our readers may be interested in the work of the Foundation: Centre for German Communication and related Technology 1920-1945 (Stichting Centrum voor Duitse Verbindings- en aanverwandte Technologieën 1920-1945). The purpose of the Foundation is to study some aspects of Germany's technological history as well as its preconditions in the period 1920-1945.

As the chairman of the Foundation, Arthur O. Bauer, writes:

"Shortly after the end of the hostilities in Europe no really systematic research on Germany's technology was initiated by the Allies, besides some specific topics. The efforts of those post-war evaluations often resulted in tremendously fragmentary documentation, [which is hard] to trace today.

"Two fundamental circumstances occasionally resulted in inadequate documents:

"Firstly, the [poor] interpretation and/or understanding of the technical and/or theoretical principles.

"Secondly, perhaps more significant is the lack of comprehension of the German language.

"Because of this, many modern historians, when dealing in this field, have to rely often on translated documents, so via sources from the second up to the nth hand."

The Foundation is trying to rectify this in several ways. Mr. Bauer is writing a book on the Allied Huff-Duff (HF/DF) versus the German U-boat wireless communication in the period 1939-1945; the Foundation is planning to publish in English a bulletin on receivers and transmitters, radar technology, crypotological technology, components, electronic tube technology, and other topics; the Foundation holds artifacts and archives, which are searchable on dBase; and exhibits are developed for other meetings, such as the summer 1995 meeting at IEE headquarters in London on 100 Years of Radar.

For further information, please contact: Stg. C.D.V. & T. '20-'45, Pater Pirestraat 29, 1111 KR Diemen, The Netherlands; telephone 0031 20 6991848 or 6996262; fax 0031 20 6991848; e-mail 101.471.2712@compuserve.com

ABSTRACTS

William R. Hewlett

William Hewlett, founder and President of Hewlett-Packard company, earned a B.A. from Stanford University in 1934 and a M.S from MIT. Hewlett's research on the audio-oscillator led to his engineering degree in 1939. Hewlett served in the Signal Corps during WWII. He also served on an intelligence gathering mission in Japan to gain information on Japanese science.

The story of the foundation of Hewlett-Packard has been extensively written on.This interview instead attempts to focus on the background of Hewlett's connections with Stanford University, his relationship with Fred Terman and Dr. ?Fred Sterling, and Hewlett-Packard's interest in educational programs stressing theoretical training in the engineering field. The interview begins with an overview of Hewlett's educational experiences at Stanford and MIT and his early involvement with Terman. Hewlett offers an insightful analysis of Terman's position within the engineering and educational fields. The interview continues with a discussion of Hewlett's activities during World War II, where he was attached to the office of the Chief Signal Officer for most of the war. Hewlett then provides information on a group of core HP personnel, including Noel Eldridge, Noel Porter, and Barney Oliver.

The interview then continues with a discussion of the Hewlett-Packard Company during the late 1940s and 1950s and the rise of Stanford's engineering school during this period. The last section of the interview covers the transition of HP from a small technical firm to a large, diversified publicly owned corporation by the early 1960s. Hewlett discusses HP management policy, his own philosophy concerning organization and personnel management and his interest and involvement in IRE's Professional Group system in the early 1950s. The interview concludes with a brief historical overview of the intellectual engineering community based at Stanford and the rise of the semiconductor industry in the area as well as HP's response to semiconductor technology.

James Hillier

James Hillier is best known for his work on the development of the electron microscope. He began his research as a graduate student at the University of Toronto in the late 1930s. He and Albert Privas developed the magnetic transmission electron microscope in 1938. Hillier was also involved in developing techniques for specimen preparation which allowed broader applications of the electron microscope. Hillier spent most of his career with RCA, where he was also involved in video disk research, and became director of research.

The interview covers Hillier's early work in the development of the electron microscope as a graduate student and with RCA, which he joined in 1940. In 1941 Hillier developed the first scanning electron microscope in the United States. Much of Hillier's work in electron microscopy during the years 1940-1953 focused on expanding the ways to make specimens usable in electron microscopes. He also developed the procedure that allowed magnetic lenses to be perfectly symmetrical. Hillier discusses the importance of relating technology to the economy at large, as well as technology's role in addressing broad social problems. He is particularly sensitive to the often conflicting, yet complementary relationship between research goals and business goals. He also discusses his management philosophy, defined in part during his later career in administrative research at RCA.

B. Richard Teare

Dr. Benjamin Richard Teare Jr.'s childhood fascination with science and radio presaged his successful career in electrical engineering and association with the AIEE and IEEE. A graduate of the University of Wisconsin, he worked several years for the General Electric Company and then joined the Yale University faculty in 1933. In 1939 he headed the new electrical engineering graduate program at the Carnegie Institute of Technology, which later became Carnegie-Mellon University. He was involved with the accreditation of engineering schools throughout the United States, and was an advisor on engineering concerns for World Bank international projects. He became Emeritus University Professor of Engineering at Carnegie-Mellon after retiring in 1975. Teare was active in many AIEE committees and crucial to the merger of the AIEE and the IRE into the IEEE.

The interview describes Teare's lifelong commitment to electrical technology and the electrical engineering profession from the early 1920s to the 1970s. He discusses his experiences at the University of Wisconsin, Yale University, General Electric, Carnegie-Mellon University, and with professional electrical engineering societies. He recalls early political decisions surrounding the IEEE's creation, as well as various personalities affecting the merger. The interview also briefly examines his educational philosophy and published materials.

Arno Penzias

Penzias was born in 1933 in Munich, and received a B.S. from City College of New York in 1954, a Ph.D. from Columbia in 1962. Although his primary work has always been in research and management at Bell Labs, he has held appointments at Princeton, Harvard College Observatory, and Stony Brook. He was hired by Bell in 1961, became a radiophysics department head in 1972, and was named director of the Radio Research Laboratory in 1976. At the time of this interview in 1980, Penzias was Executive Director of Bell Labs.

Penzias focuses on social issues such as the reciprocal obligations of scientists, commerce, and society. He discusses government regulation, the social effects of technology, and issues of privacy related to new technologies. Another significant theme is affirmative action and Bell Labs' efforts to recruit diverse researchers. The interview touches on Penzias' flexible management of creative talent, the issue of women in science, and the question of racial discrimination in the workplace.

Harold H. Beverage

Harold Beverage, known for his pioneering research in early radio, was the former director of radio research for RCA Laboratories. He was also vice-president in charge of research and development for RCA Communications. Beverage, along with Phillip Carter, established the first RCA Laboratory in a tent at Riverhead, Long Island, New York in 1919.

The interview describes events leading up to the formation of RCA in 1919, the invention of the wave antenna, and the first reception. Beverage discusses Dr. Hansel's development of the first crystal-controlled transmitter and the first 15-meter transmitter. The interview describes Major Armstrong's four major inventions, including the superheterodyne and wide-band frequency modulation. Beverage also discusses his relationships with Guglielmo Marconi and Ernst Alexanderson.

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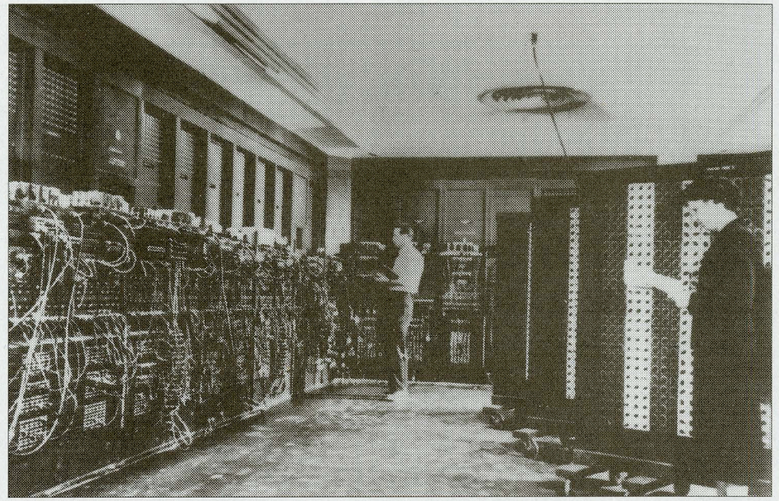

ENIAC, the first modern electronic computer, celebrates its 50th anniversary this year.

Computing at 50

The University of Pennsylvania and its School of Engineering and Applied Science will be sponsoring a joint technical and historical symposium commemorating the 50th anniversary of the Moore School Lectures in Philadelphia on May 17-18, 1996. Anticipated topics for the historical sessions include scientific computing, computer science, the postwar computer industry, the public image of computers, the federal government's role in the development of computing, computer users and applications, telecommunications and network technologies, computers and systems methodologies, and marketing and selling computing.

For further information, contact Atsushi Akera, Eniac 50th Symposium, Department of History and Sociology of Science, University of Pennsylvania, 3440 Market St.

Note for Authors

IEEE Technology and Society Magazine invites commentaries, special articles, and feature articles (refereed) on topics within the scope of the IEEE Society on Social Implications of Technology, in the broad areas of social implications of electrotechnology, history of electrotechnology, and engineering ethics. Submitted manuscripts for articles should typically be no longer than 12-15 double-spaced typed pages, but longer feature articles (up to 30 pages) will be considered. Commentaries (2-4 double-spaced typed pages) and letters to the editor (1-2 double-spaced pages) usually focus on previously published papers, IEEE and SSIT affairs, and conferences.

Four copies of papers and commentaries (two copies of letters) should be submitted to the editor. References and footnotes should appear as separate lists at the end of the paper.

After acceptance, authors must supply an electronic version of their manuscript by disk, e-mail, or modem. Additional information will accompany the acceptance letter. Authors are required to sign an IEEE copyright transfer form before publication of their paper and to obtain "authors-info"

For more information, contact Ronald R. Kline, Editor IEEE Technology & Society Magazine, School of Electrical Engineering and Dept. of Science and Technology Studies, 413 Phillips Hall, Cornell University, Ithaca, NY 14853, tel: 607-255-4307.

New Partners

We are pleased to welcome three new members to the Partnership Program. Emerson W. Pugh joins at the Colleague level, while Hitachi Ltd. and the IEEE Denver Section join at the Associate level. The Denver Section is the first IEEE Section to join the Partnership Program. The support of all these donars is deeply appreciated.

How You Can Help

continued from page 1

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