

CHARLES BABBAGE INSTITUTE NEWSLETTER

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CENTER FOR THE HISTORY OF INFORMATION PROCESSING

Charles Babbage Institute Annual Report for 1988-89

CBI in the past year went through several major changes in staff, which had a major affect on the administration of CBI and two of the principal historical projects under way. During the summer of 1988 LaVonne Molde left CBI and Judy Cilcain joined as Associate Administrator of the Institute. We took the opportunity to make changes in the administration of CBI, both in the delivery of support services to projects and budgeting and reporting schemes. At the end of the CBI year William Aspray left to assume the directorship of the IEEE Center for the History of Electrical Engineering. In the coming year, a replacement for Dr. Aspray will be recruited. Meanwhile, to pursue his work

on one of the new studies, Ms. Judy O'Neill temporarily joined the staff.

Historical Research Program

In the historical research area, the story of CBI efforts continues to be a number of projects on various aspects of scientific and industrial development. What is new about the story is a determined shift to research topics nested in the 1960s and 1970s.

- A new project that consumes much of the CBI historians' time is a two-year, three-part historical research project, sponsored by the Defense Advanced Research Projects Agency/Information Science and Technology Office

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History of Computing in France

by Pierre E. Mounier-Kuhn
Conservatoire National des
Arts et Métiers

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The computer era began in France eight or ten years after its Anglo-Saxon dawn. It seems that the same delay applies in the History of Computing.

By the mid-1980s, several persons in France became interested in this subject. Books were written (Moreau 1984, Breton 1987, Ligonnière 1987), scholarly works were presented (Baron 1987, Mounier-Kuhn 1987), associations were created (AIHTI, ACONIT). A journal, *Sciences et Avenir*, devoted a special issue to "La sage de L'informatique" (1985). People who had been pioneers in electronic computing, such as François-H. Raymond, were also jotting down their memoirs and writing some reflections about the rather checkered history of computer sciences and industry in France. The *Fédération des Equipes Bull*

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ERA Chair Donors Honored

On Monday, 16 October 1989 at the Charles Babbage Foundation Annual Dinner held at the Minneapolis Institute of Arts, the University of Minnesota honored the three pairs of major donors to the ERA Land-Grant Chair in the History of Technology: Adelle and Erwin Tomash, Mildred and Willis Drake, and Patricia and Frank Mullaney. (See *CBI Newsletter* Volume 11, No. 3 for a description of this Chair.) In his introductory remarks Dean E. F. Infante of the Institute of Technology of the University of Minnesota described the Babbage Institute as one of the jewels in the crown of the Institute of Technology. He stated that the Chair is an important commitment to the future of the history of information processing. He said that the Chair will help ensure the present and future quality of research

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Correction

CBI Newsletter, Vol. 11, No. 3, Spring 1989, on page four stated in the caption for Figure 1: "A Cray-1, Serial #14 will be on exhibit—the only public exhibit of a Cray in the United States." Dr. Robert W. Seidel, Administrator of the Bradbury Science Museum at Los Alamos National Laboratory, has written, asking for a correction of this statement. Seidel states, "We placed the Cray IA from the Computing Center here on display in the Bradbury Science Museum on March 15, 1989 and it will remain on display here indefinitely." Our thanks to Dr. Seidel for this information. □

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(DARPA/ISTO) with administrative assistance from NASA-Ames and the Information Sciences Institute of the University of Southern California. Begun in November 1988, our study is examining the history and influence of the predecessor of ISTO, the Information Processing Techniques Office (IPTO), from its beginnings in 1963 through the early 1980s. The final conclusions will be presented in a report submitted to ISTO. This report is to include a management history of the DARPA/IPTO Office. This study will allow us to investigate such questions as the development of IPTO within DARPA and the Department of Defense; the evolution of IPTO's programs; the management style of IPTO, and changes in it over time; the interactions of IPTO with its principal investigators and more generally with the academic and commercial sectors; and the evolution of its general objectives and its effectiveness in meeting them.

To test the influence of IPTO, CBI has undertaken detailed examinations of three technical areas (timesharing, networking, and artificial intelligence) in which IPTO has historically provided major support. We will investigate the major projects sponsored by IPTO in

these three areas and evaluate the overall effect of IPTO sponsorship on the advancement of these research areas.

In the report, we will merge the findings of our management history with those from our three case studies to reach general conclusions about IPTO and its programs. We will also set our findings in the context of larger historical issues about the overall development of computer science and technology and more generally about the role of technology in American society.

In the first eight months of the project, we had examined a significant number of records of DARPA in the National Archives, conducted twelve interviews, mostly with program directors and management people, and begun an analysis of the principal issues requiring discussion in the management history. This project will be the major focus of the research program in the coming year.

- Work on the second phase of William Aspray's history of the computer as a scientific instrument, focusing on the contributions of John von Neumann, was essentially complete at the end of the year. In the second phase, he conducted research and wrote on von Neumann's life and his design and construction of computers. This will be combined with earlier research on von Neumann's contributions to scientific computation, numerical analysis, and the theory of

computation. A monograph containing this material will appear in the coming year.

- While progress was made on an investigation of the origins of the computer industry in the United States, the change in administration and the initiation of the DARPA/ISTO project required that less effort be given to this work. It will assume first priority and be completed at the end of the DARPA/ISTO project.

- This was an especially productive year for the submission and publication of manuscripts. The 14th Reprint Series Volume, *The Early British Computer Conferences*, appeared. *Computing Before Computers*, a collection of essays edited by William Aspray, is in the final stages of production and should appear late in 1989. Eight articles on various aspects of computing history were published or completed during the year.

Archives Research and Development Program

The highlight of the archives program this year was the publication of the results of the joint company records project with Control Data Corporation (CDC), supported by the National Historical Publications and Records Commission. *The High-Technology Company: A Historical Research and Archival Guide*,

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CHARLES BABBAGE INSTITUTE NEWSLETTER

The Charles Babbage Institute, Center for the History of Information Processing, is sponsored by the University of Minnesota and the information processing community. Arthur L. Norberg, Director

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Second Charles Babbage Foundation Lecture, 16 October 1989, University of Minnesota

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in the field as well as enhance the Babbage Institute's worldwide reputation as a center of excellence.

Infante then introduced Provost and Senior Vice President for Academic Affairs, Leonard V. Kuhi. Kuhi thanked the Babbage Foundation for its continued support and summarized the contributions and achievements of the major donors to the Land-Grant Chair. He then made the presentations.

Adelle and Erwin Tomash were presented a chair inscribed as follows: *The Engineering Research Associates, Inc. Land-Grant Chair in the History of Technology presented to Adelle and Erwin Tomash whose devotion to scholarship, generosity to the University, and contributions to the information processing industry are an inspiration to others. The Institute of Technology, University of Minnesota, October 16, 1989.*

Mildred and Willis Drake were also presented with a chair, inscribed with these words:

The Engineering Research Associates, Inc. Land-Grant Chair in the History of Technology presented to Mildred H. and Willis K. Drake for their generosity and dedication to the University and for their contributions to the information processing industry in Minnesota and the nation. The Institute of Technology, University of Minnesota, October 16, 1989.

Patricia and Frank Mullaney received a sterling silver medallion inscribed with their names on the front and the following on the obverse:

For Your Generous Financial Contribution to the ERA Land-Grant Chair, 10-16-89." □



ERA Chair presentation—standing left to right: Arthur L. Norberg, Director, Charles Babbage Institute; Leonard V. Kuhi, Provost and Senior Vice President for Academic Affairs, University of Minnesota; Adelle Tomash, secretary, Charles Babbage Foundation; E. F. Infante, Dean, Institute of Technology, University of Minnesota; seated: Erwin Tomash, Chairman, Charles Babbage Foundation.



ERA Chair presentation—standing left to right: Leonard V. Kuhi; Mildred Drake; E. F. Infante; seated: Willis K. Drake, President, Charles Babbage Foundation.



ERA Chair presentation—E. F. Infante; Patricia Mullaney holding medallion; Frank Mullaney, Charles Babbage Foundation Trustee; Leonard V. Kuhi.

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endeavored to collect business archives and to restore vintage machines.

In 1987, a few enthusiasts decided that it was high time to gather these initiatives, and organized a meeting in Grenoble (3-5 May 1988). This conference was very successful, attracting more than a hundred people—mostly veterans of the computer field, beaming and congratulating each other under the admiring eyes of younger scientists, engineers, and historians.

Seven general themes were addressed:

- The emergence of computing as a scientific discipline.
- The birth and evolution of the hardware and software industry.
- The role of public policy and government in the development of "informatics."
- Research and innovation in computing.
- The evolution of education and professions in the computer field.
- The pioneer users of computers.
- A history of the reflections about the role of "informatics" in society; computer mythology.

The preprints of the lectures were already bound and available. An exhibition showed various devices, old books, and machines, for example a Bull T30 tabulator (1931); "Couffignal machine" (1951); a Bull Gamma 3 electronic calculator (1951); and a second generation SEA CAB 500 "minicomputer" (1959).

The final version of the proceedings will be published in 1989 by the Grenoble team, which is also collecting archives, encouraging historical research and preparing a museum of calculating machines with the *Association pour un conservatoire de l'informatique et de la télématique* (ACONIT).

A group within the professional *Association française pour la cybernétique économique et technique* (AFCET) studies the history of important concepts in the computer field, such as information, electronics, virtual memory.

In Paris, October 1988, the *Conservatoire national des arts et métiers* (CNAM), whose museum hosts Pascal's machine and Vaucanson's automata as well as electronic devices, is starting a course in the history of computing. The second meeting on the History of Computing in France will take place at CNAM in the beginning of 1990.

Lectures on technical topics will be welcome of course, but the main themes will deal less with pure invention, and more with the industrial and commercial aspects of the evolution of computer activities: with the market and the innovation.

References

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- Colloque sur l'histoire de l'informatique en France*. May 1988, preprints, Ph. CHATELIN éd., INPG, 46 av. Félix-Viallet, 38031 Grenoble.
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- Moreau, René, 1984. *The Computer Comes of Age*. Cambridge, MIT Press.
- Mounier-Kuhn, Pierre-E., 1987. *Le Comité national et l'émergence de nouvelles disciplines au CNRS: le cas de l'informatique (1946-1976)*. Mémoire de DEA, CNAM-STIS, Paris.
- Raymond, François-H., "Informatique et Automatique," *Automatisme*, 9, Sept. 1970; *Notes sur l'informatique*. 1981, republished in the proceedings of the 1988 Grenoble meeting. □



Professor Joseph F. Traub, Columbia University, delivering Second Charles Babbage Foundation Lecture, 16 October 1989

Paris Conference: Call for Papers

An international conference on the History of Computing will take place on 24, 25, and 26 April 1990 in Paris at the Conservatoire National des Arts et Métiers (CNAM). Five themes will be addressed, the first four dealing with the history of computing in France and the last with international comparisons, as follows:

- Evolution of the Uses and Users of Computers
- Manufacturing and Selling Computers and Peripherals
- Software and Software Companies
- Research and Science Policies
- History of Computing in Different National Environments (than France).

Persons wishing to give a lecture should send three copies of a two-page project to:

2ème Colloque sur l'Histoire de l'Informatique Centre Science, Technologie et Société, CNAM, 2 rue Conté, 75003 Paris, France

The deadline for French projects was 25 November 1989. Projects from elsewhere will be considered until the end of January 1990.

The final program will be published after selection of the projects, in February. CNAM would like to receive the final versions of the papers by 1 April so that they can be copied and made available for the conference.

The conference is open to anyone. The registration fee is \$160 (FF 1,000). □

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prepared by Bruce Bruemmer and Sheldon Hochheiser, presents a generic description of industrial activity in the high-technology environment and introduces a technique, called a "documentary probe," for obtaining general historical and documentary information about these companies. Use of the description and probes offers a pragmatic way to identify historically valuable materials in a high-technology firm, a dynamic environment that is usually plagued by an enormous volume of records. This guide is being distributed by the Society of American Archivists. The completion of this guide and the CBI/CDC project on which it was based also concluded the National Collecting Strategy Program begun four years ago.

In archives development, 22 new collections (250 linear feet) were added to the CBI Collection. A listing of these collections can be found immediately after this report. CBI also recorded 25 new interviews and recorded more material for 2 earlier interviews. Processing continued on earlier acquisitions and many of these new additions, both collections and interviews, were attended to as well. □

International History of Computing Conference

The second International History of Computing Conference was held in Manchester, England, on 19-20 July 1989, arranged by Dr. Geoffrey Tweedale, Director of the National Archive for the History of Computing, and hosted by the Center for History of Science, Technology, and Medicine.

During the two-day meeting, twelve papers were delivered by representatives from seven nations (Canada, England, France, Italy, Sweden, United States, and West Germany). The papers ranged from a description of research on the Schickard calculating machine to developments in supermarket systems using laser scanners in the 1970s. Informal exchanges were the highlight of the meeting, which was attended by almost 50 people. Plans are under discussion for a third meeting in 1990. Copies of the program and list of participants can be obtained by writing CBI. □

List of Collections Received July 1988—July 1989

Adams, Jr., James M. Videotape of Edmund Berkeley, 1988 1 videotape.

AFIPS. American Federation of Information Processing Societies Minutes, 1964-1986 3 cu. ft.

Auerbach, Isaac. Papers, 1950s-1980s 13 cu. ft.

Berkeley Enterprises Edmund C. Berkeley. Papers, 1945-1980 99 cu. ft.

Bright, Mrs. Lee Herbert S. Bright. Papers, 1958-1968 5.7 feet.

Control Data Corporation Market Reports, 1980s 4 cu. ft.

Davis, John S. Ramo Wooldridge. Computer Literature, 1950s-1970s 6.5 cu. ft.

Green, James The Automation Group. Product Literature, 1985 1 folder

Leacock, Robert V. Univac Scrapbook, 1950-1972 0.2 cu. ft.

Microelectronics and Computer Technology Corporation Technical Reports, 1980s 2 cu. ft.

National Institute of Standards and Technology Computer Literature Collection, 1940s-1980s 6 cu. ft.

Pair, Paul M. Biographical Records, 1980-1988 1 folder.

Rosenberg, David Honeywell, Inc. Multics Manuals and Standards Correspondence, 1962-1982 6.5 cu. ft.

Swearingen, John K. Papers, 1960-1978 4.5 cu. ft.

U. S. Dept. of Health and Human Services Computer Publications, 1949-1975. 27 books 2 boxes

Unisys Corporation Manuals, 1970-1985 6 cu. ft.

Unisys Corporation Computer Market Reports, 1985 41 cu. ft.

University of Minnesota Cybernetics 1970 1 film.

University of Minnesota Computer Literature, 1975-1982 4 cu. ft.

Warren, Jr., S. Reid Photograph and negative, ca. 1942 1 print and 1 negative

Weisbard, Michael F. Product Literature, 1969-1980 0.75 cu. ft. 1 box

Williams, Mike Frank Verzuh. Moore School Lecture Notes, 1946 1 typescript copy. □



From CBI's Photograph Collection

Eldo C. Koenig pictured in 1950 with his electric analogue computer used to analyze magnetic saturation problems. The computer was developed for Allis-Chalmers Manufacturing Company in the late 1940s. Koenig's paper relating to the use of the photo cell as a nonlinear element in the computer received the Nobel Prize in 1951. The photograph and accompanying records were donated to CBI by Koenig.

Friends of CBI

CBI offers this special acknowledgement to the individuals and groups listed below who have supported the programs of the Institute through their membership as "Friends of CBI" in 1988-89.

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Thank you all for your continuing support and encouragement. □

Auerbach Papers Document IFIP

Isaac L. Auerbach, a computer industry consultant and publisher, recently donated a collection of personal papers containing over five cubic feet of records relating to the International Federation for Information Processing (IFIP). The records include correspondence, minutes, reports, publications, and conference material documenting IFIP from its founding to the 1980s. The collection (CBI 52) is particularly comprehensive for the period that Auerbach served as the organization's first president (1960-1965). It contains information relating to the founding of the organization, other professional organizations associated with information processing worldwide, international standards in computers and data processing, and the management of IFIP.

The records are currently being processed and a preliminary inventory of the collection should be available by the end of 1989. Questions about the Auerbach papers should be directed to the CBI archivist. □



A sketch of Isaac Auerbach, then president of the International Federation for Information Processing, during a September 1963 council meeting in Golå, Norway. The sketches of the council were made by Doreen Utman.



Following Traub Lecture CBI Archivist Bruce Bruemmer chats with Walter M. Carlson and Douglas T. Ross, Charles Babbage Foundation Board of Directors Members, and Mrs. Nancy Carlson

The Adelle and Erwin Tomash Fellowship in the History of Information Processing 1990-91

The Charles Babbage Institute is accepting applications for the Adelle and Erwin Tomash Graduate Fellowship to be awarded for the 1990-91 academic year to a graduate student whose dissertation will address some aspect of the history of computers and information processing. Topics may be chosen from the technical history of hardware or software, economic or business aspects of the information processing industry, or other topics in the social, institutional, or legal history of computing. Theses that consider technical issues in their socio-economic context are especially encouraged.

There are no restrictions on the venue of the fellowship. It may be held at the home academic institution, the Babbage Institute, or any other location where there are appropriate research facilities. The stipend will be \$6,000 plus an amount up to \$2,500 for tuition, fees, travel to the Babbage Institute and relevant archives, and other approved research expenses. Priority will be given to students who have completed all

requirements for the doctoral degree except the research and writing of the dissertation, though less advanced and incoming graduate students are also eligible to apply. Fellows may reapply for up to two one-year continuations of the Fellowship.

Applicants should send biographical data and a research plan. The plan should contain a statement and justification of the research problem, a discussion of procedure for research and writing, information on availability of research materials, and evidence of faculty support for the project. Applicants should arrange for three letters of reference, certified transcripts of college credits, and GRE scores to be sent directly to the Institute. There is no special application form.

Complete application materials should be received by 16 January 1990 by the Charles Babbage Institute, University of Minnesota, 103 Walter Library, 117 Pleasant Street S.E., Minneapolis, MN 55455 U.S.A. The number of awards is dependent upon funding. □

CBI's Catalogue on LUMINA

CBI's manuscripts holdings are now listed on the University of Minnesota's automated library catalogue, known as LUMINA (Libraries of the University of Minnesota Integrated Network Access). Last summer archivist Bruce Bruemmer copied CBI's catalogue entries in the Research Library Information Network (RLIN) to LUMINA. All of CBI's manuscript holdings are now reflected in both RLIN and LUMINA.

LUMINA offers some interesting advantages over RLIN. First, the catalogue is more accessible to the local community. Public terminals are available in all of the University of Minnesota libraries, and patrons with personal computers and modems are encouraged to dial up the catalogue. Second, unlike RLIN, which usually requires a librarian to act as an intermediary, LUMINA can be searched directly by patrons. Therefore, patrons have a greater chance to uncover CBI's collections through subject searches. Third, LUMINA integrates various formats in one catalogue. In order to search manuscript collections in RLIN, it is necessary to move out of the books or serials format into the archives and manuscript control format. Again, this aspect of LUMINA increases the likelihood that the casual user will discover CBI's collections.

Records will continue to be added to LUMINA as manuscript collections are received and catalogued. In addition, CBI is investigating other ways that automation can enhance access to all of its collections. Recently, CBI applied for funding to catalogue its oral history collection on RLIN. The grant would make it possible to list the interviews locally on LUMINA as well.

Questions regarding access to CBI's holdings on the LUMINA catalogue should be directed to the CBI archivist. □

A Comparative Study of the Computer Industry in Britain and the United States

by Anthony Gandy, 1989-90 CBI Tomash Fellow, London School of Economics

In recent years there has been a number of studies of the development of the computer industry in the United States with similar publications available, or soon to be published, covering the British story. From these it appears that during the immediate post-war years technological capabilities were on a par with each other but thereafter exploitation and technical advance were achieved more swiftly in America.

The research project I am engaged on is designed to study the economic and corporate developments that led to the established market structure in Britain and the United States. I have recently joined the CBI to undertake the research of the American aspect of the topic. The final purpose of my work is the submission of a Ph.D. thesis at the London School of Economics where I am supervised by Prof. Leslie Hannah.

As is generally known, the United States market would become dominated by IBM with a number of other firms occupying the rest of the market. In Britain IBM would have to share the market with the repository of British computer activity, ICL, while a smaller percentage of the market would be filled by overseas companies, mainly from the U. S., and a limited number of minor domestic suppliers. The U. S. market from the beginning was self-sufficient and rapidly gained a world market presence, though maybe less dominate in the 1980's. The U. K. industry, however, rapidly lost domestic market share in the 1960s and never established a credible overseas position.

This has been the general position in the two markets since the late 1960s; this summary, of course, discounts much of what has happened since. To the business historian and the industrial economist the period between the awakening of the new technological opportunity and the establishment of the mature, stable marketplace has to be the focus of attention. In this case the process of technical innovation and therefore the dynamics of the market structure are not complete, making a study of earlier developments of greater contemporary relevance.

This, however, was not the starting point of the project. Initially working on the post-war development of the British electronic industry, it became obvious that a number of commentators, when writing about different sectors of the electronic market, were criticising U. K. companies along similar lines, the general argument being that the British firms were either unwilling or unable to make the long-term investment decisions needed to maintain their position in the more competitive electronic goods markets. This was contrasted to a number of their overseas competitors. Examples of this have been cited to be semiconductors (example, Sciberras; *Multinational Electronics Companies and National Economic Policy*, 1977), consumer electronics (Eric Arnold, *Competition and Technological Change in the Television Industry* 1982), and computers. I am, therefore, trying to establish whether this phenomenon can be observed by concentrating on the computer sector and whether it is common to a specific type of enterprise. Thus in my study of the data processing industry I will be looking at the efforts of the multi-product electronic companies in both countries as compared to each other, the activities and development of the companies with roots in the punch card machine industry, and the major start-up enterprises. This also gives a convenient stopping point, the time by which the electronics companies in each country had left the commercial EDP market. Comparisons will be made at both the operational computer division and the overall corporate structure and doctrine. It is vital to understand the strengths and weaknesses of the whole organisation to really comprehend the position of a company's data processing venture.

So far I have drawn on a number of sources of material. The most useful have been the found in the archives of the Institute of Electrical Engineers, London, the Ferranti Archives, Manchester, the National Archive of Computer History, Manchester, the Marconi Company Archive, Chelmsford, and the general resources of the University of London. In

my brief period at the CBI it seems that they have both a wealth of material in their archive and good connections to a number other of important repositories. Indeed the amount of accessible material in the United States does seem to be much greater. As with all business history, archival material is a major headache, especially when dealing with such a recent period in corporations' lives. A colleague of mine at the LSE suggested that the problem is compounded when firms are conscious of having "under-performed" as compared to their competitors. As he is studying the British car industry, I am sure he has had ample opportunity to reflect on this obstacle. Many of the relevant companies, especially on the electronics side in the U. K., either have no archive or do not allow entry—not an uncommon problem for researchers of the corporate world.

Not surprisingly I have noted similarities in both the type of firms involved and the strategies they adopt in the two EDP industries. Equally unsurprising are the number of differences. While both countries saw the entry of both their major electronics companies and the business machine operators, the U. S. also had a number of significant new firms start operations. The U. S. electronics companies did follow their British counterparts and abandon this market, but this took place significantly later. The similarities may suggest parallel strategies and/or similar circumstances faced by the companies. The differences can again be explained in terms of corporate policy or the environment they were operating in. Which is the greater cause of difference is the object of my project. □

UNIX Creation Documented

Insights into the people and forces behind the creation of the UNIX® operating system twenty years ago at AT&T Bell Laboratories are the focus of an audiocassette tape recently released by AT&T.

The 32-minute tape features interviews with such key UNIX system pioneers as Ken Thompson, Dennis Ritchie, and Doug McIlroy. This is the first time the story has been told by the scientists that participated in the effort. The tape is part of a larger oral history of the UNIX system, commissioned by AT&T Bell Laboratories. The history, which focuses on the early years of the UNIX system, is to be completed by the end of 1990.

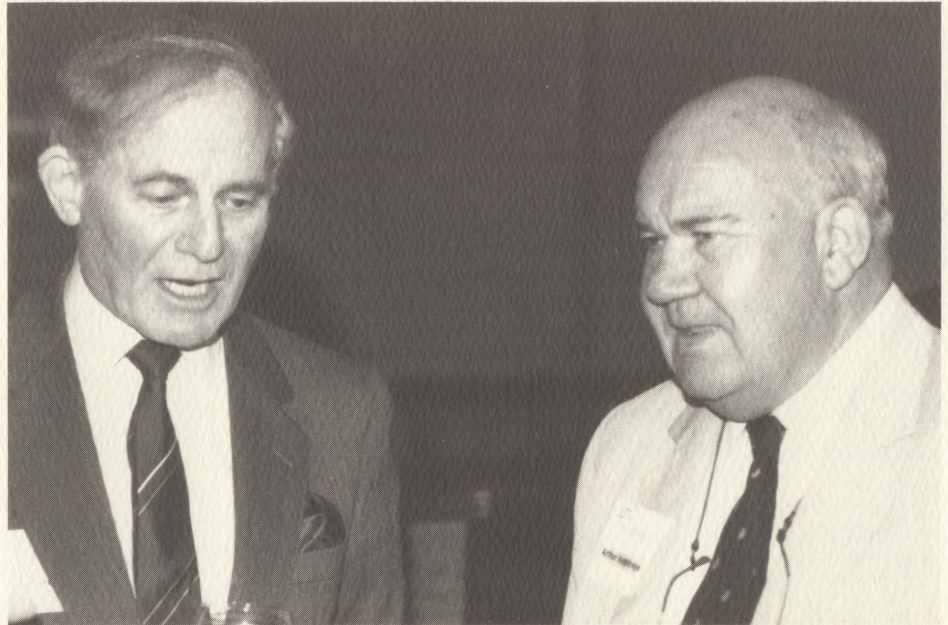
One significant insight that has emerged from initial interviews is the important role that the early UNIX system manual played in shaping the system. Far from just a clerical task, the manual served as a discipline for cleaning up and otherwise improving software. "Producing the manual involved rewriting all sorts of programs in order that they should meet the same high standard," explains Sandy Fraser, who was there at the time. Fraser is now Executive Director, Research, Information Sciences Division at AT&T Bell Laboratories.

The interviews and historical research are being done by Michael S. Mahoney, Princeton University professor of the history of science. "While books and articles have been written on the origins of the UNIX system, so far no study of the origins of the system has explored critically the institutional culture and personal relations that shaped it both as an operating system and as an approach to computing," Mahoney said. "The UNIX system reflects the ethos of a community of researchers who combined different backgrounds and interests into an unusually coherent programming environment, and it is of interest to know just how that came about."

Copies of tapes and transcripts will be made available free of charge to academic and historical institutions, such as the Smithsonian Institution and the Babbage Institute. Copies will be available to the general public at a nominal cost.

The initial 32-minute tape, entitled "Release.0, The Beginning," is also free of charge and may be obtained by writing to: Michael D. Miller, AT&T Bell

Laboratories, Room 1L-414, 101 JFK Parkway, Short Hills, NJ 07078 U.S.A. □



Erwin Tomash and Arthur L. C. Humphreys, International Computers Ltd. and Charles Babbage Foundation Board of Directors Member at Charles Babbage Foundation dinner.



Leonard V. Kuhl; Walter Bauer and Clarence Spangle, Charles Babbage Foundation Board of Directors Members at Charles Babbage Foundation dinner.

IEEE Fellowship in Electrical History

The Institute of Electrical and Electronics Engineers (IEEE) invites applications for its 1990-91 Fellowship in Electrical History.

The Fellowship supports either one year of full-time graduate work in the history of electrical engineering and technology at a college or university of recognized standing or up to one full year of post-doctoral work in the same field for a recent graduate.

The IEEE Fellowship in Electrical History is made possible by a grant from the IEEE Life Member Fund and is administered by the IEEE History Committee.

Further information and application materials may be obtained by writing to Director, Center for the History of Electrical Engineering, Institute of Electrical and Electronics Engineers, 345 East 47th Street, New York, NY 10017 U.S.A.

The deadline for the submission of all application materials is 1 February 1990. □

WGBH/BBC Series on "The Information Age"

Public television station WGBH in Boston recently announced that "The Information Age," six one-hour programs on the history of the computer, began production this past summer, thanks to the underwriting support of the Association for Computing Machinery (ACM).

Premiering in fall of 1991, "The Information Age" is a joint production of The WGBH Science Unit, producers of "Nova," and the British Broadcasting Corporation. The series will appear on public television stations nationwide and on BBC-TV in England.

In keeping with public television's diverse funding arrangements, underwriting for "The Information Age" will come from several sources. The ACM, an educational and scientific organization, has made an unprecedented contribution to public television of nearly \$600,000. In addition, Unisys Corporation signed on as the series' corporate sponsor. BBC-TV has contributed \$1.2 million as part of their co-production agreement with WGBH.

Chronicling the rise of computer

technology from the 1946 debut of ENIAC, the world's first electronic digital computer, to the "Fifth Generation" of computers capable of performing parallel thought-like functions, "The Information Age" will offer viewers a thorough understanding of how this remarkable machine has become a part of almost every human endeavor.

The series liberates the computer from its status as a cold, impersonal machine and reveals it as the product of hard work and human ingenuity—the brainchild of colorful visionaries, brilliant scientists and engineers, industrial pioneers, and entrepreneurs.

Paula S. Apsell, executive producer of "Nova" since 1984, will oversee the production of "The Information Age." Jon Palfreman, a ten-year veteran of BBC science programming, is executive producer, and Nancy Linde is producer. The Advisory Panel for the series is composed of David K. Allison, Daniel C. Dennett, John J. Hopfield, Alan Kay, Robert Lucky, Marvin Minsky, Arthur L. Norberg, and Robert Noyce. □



Joseph F. Traub and Pamela McCorduck, Charles Babbage Foundation Trustees, at Charles Babbage Foundation dinner.

Sources in Electrical History Published

The Center for the History of Electrical Engineering has published *Sources in Electrical History: Archives and Manuscript Collections in U. S. Repositories*, compiled by Joyce E. Bedi, Ronald R. Kline, and Craig Semsel (New York: IEEE, 1989). The 234-page, illustrated guide lists 1,008 collections in 158 repositories, primarily university archives and state historical societies. Subject and repository indexes are included.

This is the first in a series of guides to be issued by the Center. The goal of the series is two-fold—to promote research in electrical history by making scholars and students aware of the diverse collections of primary sources and to encourage the collection and preservation of these

materials by archives and manuscript repositories. Future volumes will cover oral history collections in the U. S., U. S. business archives and private collections, and collections held in repositories outside of the United States.

Sources in Electrical History: Archives and Manuscript Collections in U. S. Repositories is available at a cost of \$15.00, prepaid. Please send a check or money order made payable to "IEEE" to *Sources in Electrical History*, Center for the History of Electrical Engineering, IEEE, 345 East 47th Street, New York, NY 10017 USA.

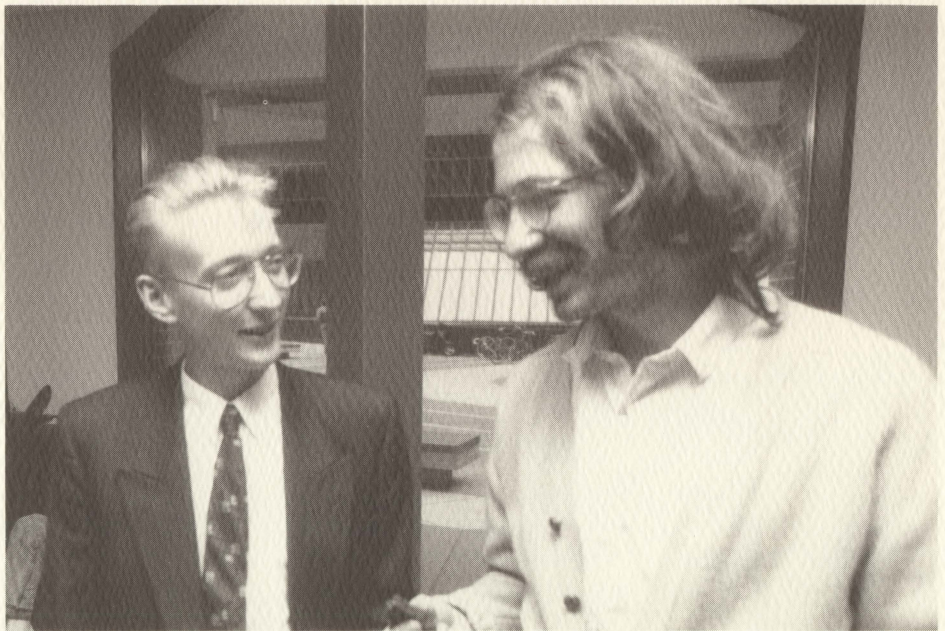
Publication of this guide was made possible by a grant from the Friends of the IEEE Center for the History of Electrical Engineering. □

SHOT Special Interest Group in History of Computing Holds Third Annual Meeting

The Society for the History of Technology (SHOT) Special Interest Group in Information, Computing and Society held its third annual meeting in Sacramento, California on 14 October 1989 with William Aspray in the chair. Representatives from France, The Netherlands, Norway, and the United States described a wide range of projects being pursued at their organizations. Many of these projects have been or will be reported in this *Newsletter*.

Two sessions at the SHOT meeting were on the history of computing, one of them arranged on behalf of the Interest Group. The group discussed topics for a session at the next annual meeting. CBI agreed to use its *Newsletter* as the vehicle for transmitting information about the Group and to maintain a mailing list of interested people.

The Group elected David K. Allison, National Museum of American History, Smithsonian Institution, as chair. Anyone wishing to become associated with this Interest Group can do so by writing to David Allison at the Smithsonian or Arthur Norberg at CBI. A copy of the mailing list will be sent to persons who have attended past meetings and to new persons inquiring about the Group. □



Anthony Gandy, CBI Tomash Fellowship Holder, and Lance Smith, CBI Research Assistant, chat after Traub Lecture.



Alan Shapiro, Director, History of Science and Technology Program, University of Minnesota; Linda Shapiro, New Dance Company; Leonard V. Kuhl at Charles Babbage Foundation dinner.

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