CHARLES BABBAGE INSTITUTE
CENTER FOR THE HISTORY OF INFORMATION TECHNOLOGY

In This Issue:

CHARLES BABBAGE INSTITUTE

CENTER FOR THE HISTORY OF INFORMATION TECHNOLOGY

NEWSLETTER   Winter/Spring 2003

Vol. 25

Nos. 2-3

In This Issue:

The International History of Information Technology at CBI

By Jeffrey R. Yost

Internal and external research and collection development at the Charles Babbage Institute has long concentrated on fundamental developments, use, and social impacts of computing, software, and networking in the United States. Alongside these efforts, the Institute has also shown a continuing commitment to advance knowledge and resources on the international history of information technology. This latter commitment has taken many forms, from co-sponsoring conferences and symposia abroad and supporting internationally-focused projects as part of the CBI/Tomash Fellowship Program, to internal CBI research projects, collaborative research and publications, collecting significant archival records on international topics, and aiding and facilitating resident and remote international users of the CBI archives.
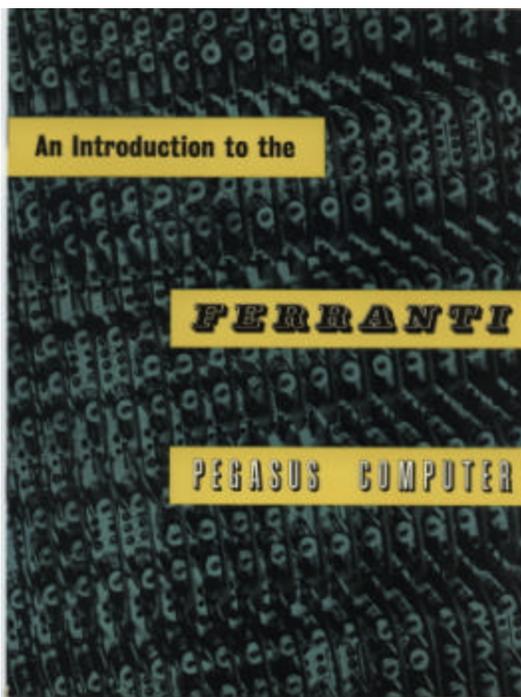
This past year CBI Director Arthur Norberg (with Ulf Hashagen and R. Keil Slawik) co-edited a volume on the history and historiography of software entitled *History of Computing: Software Issues.* This book contains revised proceedings of the 2000 International Conference on the History of Computing held at the Heinz Nixdorf MuseumsForum in Paderborn, Germany. The collaborative event brought together a number of European and American scholars and software pioneers to address a range of issues regarding preserving, conducting, and publicizing the international history of software.

CBI's new (2003-2004) Tomash Fellow Eden Miller, a MIT doctoral student who is originally from Columbia, South America, is researching a dissertation on how computing technologies advance ideological projects in the developing world. Specifically, she is examining Chile's Cybersyn project (see related article on Miller). Miller is one of a number of past CBI/Tomash scholars who has worked on the international history of computing. CBI's current fellow Gualtierro Piccinni, an Italian scholar studying at the University of Pittsburgh, is researching cognitive science and computing developments in British and U.S. contexts. The previous Tomash Fellow, Rachel Yould (Oxford University), explored cultural differences of Internet use in Japan and the United States. Past fellows have explored a number of other international topics including: the results of the Soviet Union's governmental effort to promote and fund the implementation of computing

technology into industrial enterprises and efforts of British and American electronic firms to enter into computer manufacturing.

CBI historians have also conducted a number of oral history interviews with international figures in the history of software and computing. Most recently, CBI Software History Project Manager Philip Frana interviewed two significant individuals in software history in the United Kingdom as part of CBI's NSF-Sponsored Project, "Building a Future for Software History": Turing Award winner C. Antony R. Hoare and Peter Watson, the CEO of Berkeley Computer Services (Scotland's oldest software house).

A sampling of the many oral histories with international individuals in the history of computing and software held at CBI include interviews with Arthur L. C. Humphreys (former managing director of International Computers, Limited); Curt Herzstark (an Austrian inventor and manufacturer of calculators); Friedrich Ludwig Bauer (an important contributor to the logic computer STANISLAUS and the European development of ALGOL); Heinz Zemanek (an Austrian computer scientist who designed and built the MAILUFTERL computer, and LOGALGOL and other compilers); Antonin Svobada (a Czech computer pioneer who helped developed SAPO); and David J. Wheeler (a contributor to the EDSAC project).

CBI historians also present work at international history conferences. Last fall Philip Frana presented a paper on the history of medical informatics at a Scottish conference entitled, "Technotopias: Texts, Identities, and Technological Cultures" (See related article on Technotopia conference).

The infrastructure for future scholarship on the international history of information technology is also advanced through scholars who use collections in the CBI archives. While many of the materials on the international history of information technology are held at repositories abroad, certain records are appropriately held at CBI or other U.S. repositories. CBI has strategically collected a variety of significant international records. A short while ago, CBI acquired the International Y2K records. This collection documents the planning and evaluation of the international community in advising on perceived threats posed by the widespread use of only two-digit dates in software code. Among other internationally focused collections is CBI's International Computing Collection (CBI 62). This collection contains reports, surveys, publications, and papers from many countries in Europe, the Americas, and Asia. There are also significant materials for research on the international history of computing contained in major corporate collections such as Burroughs and Control Data, as well as other collections.

CBI staff also work with international scholars and assist them with using CBI materials. This includes past long-term scholars in residence, such as Corinna Schlombs, a doctoral student from Bielfeld University in Germany, and doctoral scholar Osamu Uda from Japan. Such scholars worked closely with both CBI historians and archivists. The CBI archives have assisted many other international scholars both at the institute and remotely. During the past year CBI archivists have helped researchers from Spain, Pakistan, Australia, and other countries. Typically, more than 15 percent of the hundreds of scholars and other patrons using the CBI archives each year have been from abroad.

Software History Dictionary Project Unveiled

CBI unveiled advanced work on a Software History Dictionary in early May. The current dictionary includes two hundred entries on subjects ranging from operating systems and computer graphics to applications in artificial intelligence, business, and medical informatics. The current reference tool comprises approximately 350 pages of information. Dictionary entries may be viewed online at http://www.cbi.umn.edu/shp/entries/dictionaryindex.html.

The online software dictionary initiative was designed not only to produce a useful reference source, but also as a methodological experiment using email and the World Wide Web. Individual entries in the dictionary are hyperlinked or have embedded within them indications for future links. Many of the entries have benefited from the in-house expertise of project staff members at CBI.

All of the entries are written in accordance with the best principles of scholarship. Input is solicited from a blue ribbon panel in naming the most important concepts to define and offering advice on content. Members of this external panel include Paul Abrahams, Ashok K. Agrawala, Michael J. Alexander, Marc A. Auslander, G. Octo Barnett, Thomas Bergin, Philip A. Bernstein, James F. Blinn, Wayne Carlson, Don Chamberlin, Jacques Cohen, Kenneth M. Colby, Fernando J. Corbatü, Edward G. Coffman, Jr., Peter J. Denning, José L. Encarnação, James D. Foley, A.G. (Sandy) Fraser, Peter Friedland, James P. Fry, Bernard A. Galler, Jim Gray, Bert Herzog, Jim Horning, Casimir Kulikowski, Richard G. Larson, David Lomet, Henry Lowood, Carl Machover, James D. Mooney, Frederic I. Parke, Robert F. Rosin, Holly Rushmeier, Jean Sammet, Natarajan Shankar, Alan Cary Shaw, Richard G. Shoup, Avi Silberschatz, Alvy Ray Smith, Michael Stonebraker, Peter Szolovits, Andrew S. Tanenbaum, Toby J. Teorey, Daniel Thalmann, Thomas H. Van Vleck, Gio Wiederhold, and William Wulf.

Other significant products of the Software History Project are also being made available this spring and summer on the CBI Web site at http://www.cbi.umn.edu/research/current.html. These products include the interim and final reports of the Software History Project, links to project oral histories and the online *Iterations: An Interdisciplinary Journal of Software History,* and a comprehensive project bibliography containing more than 2,500 references to primary and secondary works in software development and history.

All parts of the Software History Project are supported by a grant from the National Science Foundation Knowledge and Distributed Intelligence Directorate (#9979981). Two sample entries from the Software History Dictionary are reprinted below:

Atlas Supervisor.

The Atlas supervisor, designed principally by David Howarth of Ferranti Ltd, managed the operating system software for the Atlas transistorized mainframe computer, built at Manchester University in England in the early 1960s. The Atlas pioneered—among other things—in the use of multiprogramming for the purposes of spooling. That is, the operating system managed transfers of information between secondary storage drums and buffer memory.

Design of the Atlas supervisor was prompted by a realization in the late 1950s that the preliminary plans for the Atlas computer (the prototype was called MUSE, for "Micro-Second"), which was to process one million instructions per second, included insufficient mechanisms for the efficient batch processing of programs. Because the Atlas ran so quickly, the Manchester/Ferranti team decided to abandon the serial execution of programs transferred back and forth between primary memory and the drum store in favor of multiprogramming.

To this end, the Atlas supervisor supports a multiprogrammed operating system. Multiprogramming involves the simultaneous or parallel execution of two or more programs by an operating system on a single machine. The Atlas system could handle sixteen separate jobs concurrently by various types of scheduling algorithms. Atlas salespeople claimed at the time that one commercial Ferranti Atlas computer could handle the workload of four IBM 7094s.

Atlas also pioneered the concept of demand paging. Paging is one technique for allocating scarce memory in a multiprogrammed environment. Paging obviates the need to restrict programs to limits imposed by a computer's core memory, or requiring users to manually divert and recall parts of running programs to and from separate stores or secondary memory locations (then called "drum transfers").

Designers of the Atlas constructed what they considered a revolutionary "one-level store" (OLS) to facilitate the positioning and recall of *fixed-size* blocks (called "pages") of information between the main ferrite-core memory and high-speed magnetic drum storage. Paging allowed Atlas operators to execute programs the main memory alone could not accommodate. To facilitate this automatic memory management method, paging in the Atlas demanded the inclusion of special hardware in the form of "page-address registers" (PARs) and software compilers—a "Supervisor Program"—to direct them.

Program control was achieved by a three-layer set of program control registers: Main Control, Extracode Control, and Interrupt Control. All user programs and many of the routines in the Atlas supervisor itself utilized Main Control. Extracode Control was used for other parts of the supervisor as well as for "extracodes" or supervisor calls. Programs operating in real-time, such as those controlling peripheral equipment and those detecting error conditions, used the Interrupt Control register.

Simon Lavington in *Early British Computers* (1980) called the Atlas supervisor "the first recognizable modern operating system," and computer scientist Per Brinch Hansen has since termed it "the most significant breakthrough in the history of operating systems."

References.

John Fotheringham, "Dynamic Storage Allocation in the Atlas Computer Including an Automatic Use of a Backing Store," *Communications of the ACM* 4 (October 1961): 435-36.

David J. Howarth, et al., "The Manchester University Atlas Operating System: User's Description," *Computer Journal* 4 (October 1961): 226-29.

Tom Kilburn, et al., "The Atlas Supervisor," in *Proceedings of the AFIPS Conference,* vol. 20 (1961), 279-94.

Tom Kilburn, et al., "The Manchester University Atlas Operating System: Internal Organization," *Computer Journal* 4 (April 1961): 222-25.

Project Control/70.

Project Control/70 (PC/70) was a software package written in ANS COBOL and distributed by Atlantic Software, Inc. of Philadelphia, Pennsylvania, to manage the programming management process. The software was originally purchased by Atlantic from a Midwestern consulting firm in 1969, and first sold by Atlantic Software in 1971.

The PC/70 package as distributed by Atlantic Software was divided into four separate modules: planning, monitoring, accounting, and evaluation. The planning module of the software was used to define the project, derive estimates, create deadlines or milestones, and assign tasks. This module also divided the project into task and cost units. The monitoring module compared actual progress on the project with planned or estimated progress in terms of time, cost, and target dates. It engaged, in other words, in activity tracking. The accounting module kept track of data generated in planning and monitoring, and produces statistical summaries for the purposes of project evaluation. The final module, the evaluation module, was used to create project reports from the software's database of relevant facts and figures.

The PC/70 software package was available for the IBM 360 and 370 series of mainframe computers, the UNIVAC 1100 and Series 70, as well as the Burroughs B 3700 and B5500 series running under the MCP in the mid-1970s. The software had an estimated user base of 250 by August 1975.

Walter Brown and Richard Thatcher founded Atlantic Software in the summer of 1967 as a redistributor of software packages. The company reoriented itself in the mid-1970s to focus more exclusively on project management software. Atlantic Software was sold to AGS Computers in 1980.

References.

Walter Brown, "Founding Atlantic Software," *IEEE Annals of the History of Computing* 24 (January-March 2002): 80-82.

"Project Control/70," in *Datapro 70: The EDP Buyer's Bible* (Delran, N.J.: Datapro Research Corporation, September 1975).

Philip L. Frana

Eden Miller Named 2003-2004 Tomash Fellow

Eden Miller, a doctoral candidate in the Program in Science, Technology, and Society at MIT, has been named the 2003-2004 Erwin and Adelle Tomash Fellow. Ms. Miller is researching a dissertation on the use of information technology to advance state ideological projects in developing countries.

Her project, entitled "The State Machine: Politics, Ideology, and Computation in Chile, 1964-1973," examines how two consecutive presidential administrations used computer technology as part of their program for revolutionary change. The first administration, under President Eduardo Frei, used computing machinery to create a modern Chilean state modeled after western values and funded by the Alliance for Progress. The second administration, headed by President Salvador Allende, believed computers could be used to help peacefully regulate Chile's transition from capitalism to socialism. Miller's research examines not only how computers reflected the nuances, tensions, and contradictions of these historical periods, but also how these machines shaped and refined the ideological projects driving their use.

Miller was born in Bogotá, Colombia, and grew up in Maryland. In 1997, she graduated from Princeton University with a degree in Electrical Engineering and a certificate in Women's Studies. After briefly working as an electrical engineer, she decided to return to graduate school to study the social aspects of computing technology. In the fall of 1998 she enrolled at MIT in the doctoral Program for Science, Technology, and Society.

Her interest in computing in Latin America grew out of a long-standing desire to study the region of her birth and a conviction that this part of the world could inform the development and application of computer technology. While conducting exploratory research to decide upon a dissertation topic she came across a footnote describing a computer system constructed in Chile during the early 1970s that used cybernetic principles to bring about socialist change. The system offered an alternative history of computer use and provided an illustration of how cybernetic ideas influenced governing practices in the developing world.

The Tomash Fellowship is awarded each year to a scholar researching a dissertation on some aspect of the history of computers, software, or networking. The award is made possible from an endowment funded through the generous support of Erwin and Adelle Tomash, the founders of the Charles Babbage Institute.

News from the Archives

Collections received

We are pleased to announce an important addition to the **Milton Wessel Papers** currently in the CBI archives. Wessel was General Counsel to the American Federation of Information Processing Societies (AFIP) from 1968-1975, General Counsel for ADAPSO from 1966-1986, and Special Assistant to ADAPSO from 1986 until his death in 1991.

In 1990, Wessel made arrangements with past CBI Archivist Bruce Bruemmer to donate his AFIPS and ADAPSO papers to CBI. In correspondence with Bruemmer, Wessel agreed that the AFIPS papers would come first, and the ADAPSO papers in a later installment. In 1995, Bruce Bruemmer visited with Mrs. Joan Wessel, and the AFIPS papers were transferred after a gift agreement was concluded. CBI is pleased that Mr. Wessel's wish to have his papers reside at CBI has now been fulfilled. We extend our thanks to Joan Wessel for facilitating the transfer and to Ron Palenski for his assistance. A guide to the collection is available at www.cbi.umn.edu/collections/inv/wessel.htm

New oral histories available

One new oral history interviews has been added to the CBI archives and is available in full text at http://www.cbi.umn.edu/collections/oh. **Richard Canning** (OH 338) was interviewed by CBI Associate Director Jeffrey Yost. The interview text has been added to the database.

We are pleased as well to add an older history to the database. Professor **John Herriot** was interviewed in 1979. At that time, no-one could have envisioned the possibility of widespread access to archival materials on the World Wide Web. As was not uncommon at the time, Professor Herriot requested the right to preview publications quoting the interview. Because of that long out of date stipulation, we were unable to make the transcript available online. Professor Herriot passed away on March 16th, 2003. This month, his wife and son granted CBI permission to distribute the interview transcript through the database. In 1952 he was appointed the first director of the Stanford Computation Center, using a Card Programmed Calculator and later an IBM 650. He discusses the formation and funding of the Computation Center and its integration with the rest of Stanford. Herriot also discusses the formation and development of the Stanford Computer Science Department, centering on the role of George Forsythe. Affiliations between Stanford and private industry are also mentioned. A full obituary of Professor Herriot is available at http://www.stanford.edu/dept/news/pr/03/herriotobit416.html

Improvements to CBI Website

We have added a new feature to the CBI Web site. "QUICK LINKS" on the CBI home page, at http://www.cbi.umn.edu. This allows users the option to go directly to our most frequently-used resources: the *CBI Newsletter*, the Oral History Database, *Iterations: An Interdisciplinary Journal of Software History*, the Burroughs Photograph Database, the Software History Dictionary, the Software History Bibliography, the Software History Dictionary Project, and the search tools for CBI Collections. As usual, we appreciate your comments.

Progress on Norris Papers / CDC Records Project

Maria Plonski began as the Control Data Corporation and Norris Papers Project Archivist on December 2, 2002. She has surveyed approximately 440 cubic feet of material, including the William Norris personal papers, the CDC Historical Archives, and the CDC Records Center cartons and organized the various records by categories including creator, department of creation, or function. She is now organizing and rehousing planning documents and executive/administrative dayfiles. The Control Data Corporation records range from 1957-1992, and include mass-produced published materials such as brochures and manuals, as well as materials once meant only for limited internal CDC consumption ("Control Data Private"), including executive subject files, and engineering design specifications.

Next steps will include organizing and rehousing the other major series in the collection, preparing an index and description of the materials, and making it available on the CBI Web site.

Technotopias Meeting in Glasgow, Scotland

In July 2002, CBI Software Project Manager Philip Frana participated in the Technotopias: Texts, Identities, and Technological Cultures conference hosted by the University of Strathclyde, Glasgow, Scotland. Conference organizers invited a number of distinguished speakers and delegates from the diverse fields of history, cultural theory, literary criticism, art, and the sciences to encourage an open exchange of ideas on the relationship between culture and technology. The fourfold purposes of this transdisciplinary meeting were to investigate the complex historical and contemporary interplay between the humanities and technology; address the impact of technologies upon the formation of physical and cultural identities; consider historical and contemporary representations of technology; and reflect upon the place of the technical arts in the academy and the world.

Frana presented a paper entitled "Building the 'Robot Doctor': Computers and the Reconfiguration of Human Disease" in a panel looking at technical and cultural problems of contemporary biotechnology. He discussed the sources and solutions to "infoglut" in the medical sciences, the statistical problem of reasoning under uncertainty and its relation to modern medical decision making, the relationship between patient records and criminal profiling, and the crisis over decision analysis and clinical algorithms in post-Vietnam medical culture.

Special plenary speakers at the conference included Wendy Chun, who lectured on software as ideology machine; Harry Collins on the human/non-human divide; Judith

Halberstam on the cyborg in contemporary art; and Colin MacCabe on postmodern cinema and technology. A complete list of speakers may be found at the Technotopias site: http://www.strath.ac.uk/conferences/technotopias/.

Before and after the meeting, Frana conducted oral histories with two of the leading computer software professionals in the United Kingdom today: C.A.R. (Tony) Hoare and Peter Watson. Hoare is a computer scientist at Cambridge University and Turing Award winner. He is widely recognized for his fundamental contributions to the definition and design of programming languages. Watson is founder of Berkeley Computer Services, the oldest software house in continuous operation in Scotland. Since 1978 the company has been developing software and hardware solutions for the woolens, whiskey, and medical industries, most notably through its MasterPiece and MasterLab control systems.

Second Conference on the History and Heritage of Scientific and Technical Information Systems

The Chemical Heritage Foundation (CHF) and the American Society for Information Science and Technology (ASIS&T) held their Second Conference on the History and Heritage of Scientific and Technical Information Systems on November 16th and 17th, 2002, at the CHF in Philadelphia. The focus of the conference was on post-World War Two scientific and technical information systems. More than forty historians, information scientists, librarians, and other scholars took part in the event that addressed a range of informatics issues in chemistry, biology, medicine, business, and engineering.

The conference had a decidedly international flavor with a number of historians and information scientists from Great Britain participating. Displaying the British and U.S. comparative perspective from the start were the two plenary speakers: University of Wisconsin Professor Ronald Kline and University of Illinois Professor Andrew Pickering. Kline gave a talk on boundary work among U.S. and British information theorists and information scientists between the late 1940s and mid-1970s. Pickering, covering roughly the same years, provided an analysis of British cybernetics, and made some assessments of similarities and differences in the U.K. and U.S.

The presentations addressed both computing and non-computing information systems, a broad scope that was richly displayed by another featured speaker, the Smithsonian's Peggy Kidwell, in her visual survey of the information system technology in the Smithsonian's collections. This ranged from early filing systems to supercomputing technology. While many different types of information systems were discussed, a substantial portion of the talks addressed the application of digital computer technology.

Charles Babbage Institute Tomash Fellow Thomas Haigh, in highlighting the origins and early development of data processing management systems, demonstrated the transition

between pre-digital computing information processing and the emergence of electronic computer-based systems in the corporate sector. Haigh outlined the emergence of the "data base" concept in military online systems at the System Development Corporation and carried his analysis through to leading database management systems of the 1970s, such as Informatics' Mark IV. He demonstrated how this story illustrated the gulf between scientific information problems in indexing, and the use of standard commercial tools for data management.

CBI Associate Director Jeffrey Yost presented a paper on the origins and early development of medical informatics and privacy. This research was discussed in the "Current Research at CBI" article in the last *CBI Newsletter* (v.25 n.1).

Papers went through peer review before the conference, and will be published in a proceedings volume late this year.

Jeffrey R. Yost

A Notable Work: Yost's Annotated Bibliography of Resources on Scientific Computing

By Arthur L. Norberg

As part of its research program CBI, from time-to-time issues new resources to aid scholars and others interested in the history of information technology. Sometimes these are brief chronologies and bibliographies published in the *CBI Newsletter*. At other times, they are extensive reference publications that serve as significant and enduring research tools. Resource guides to primary source materials at North American repositories, the CBI oral history collection, and an appraisal guide for evaluating information technology corporation records are examples of this latter type.

In fall 2002, another work in our series of major bibliographies appeared, compiled by Associate Director Jeffrey Yost and published by Greenwood Press. Several bibliographies, such as the splendid compilations by James Cortada, already reside on library shelves. Yost work is an elegant complement to these books. Entitled *A Bibliographic Guide to Resources in Scientific Computing, 1945-1975*, Dr. Yost focused on computer applications in four scientific areas: the physical sciences, cognitive science, the biological sciences, and the medical sciences. The book begins with a brief historiographical essay that compares and contrasts computing in the the different scientific fields, and gives a quick overview of selection criteria for the bibliography that follows. With over 1,000 thoroughly annotated entries, each section is divided into
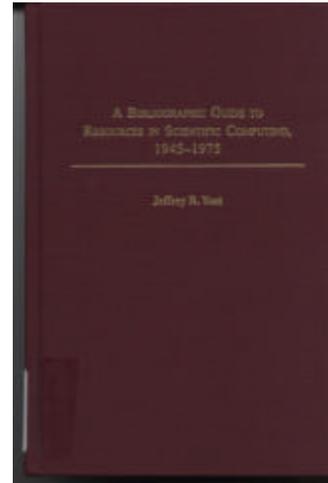
bibliographies and dictionaries, books/reports, articles, serials, manuscript collections, and oral histories. The bibliography was a component of a larger NSF-sponsored project, "The Computer as a Scientific Instrument," upon which Yost served as a co-Principal Investigator.

The annotations in this volume tend to be longer than in most bibliographies, and thus, of greater value to researchers. Space limits me to only one example, but it is indicative of the whole set. The example is a publication that is also a product of CBI's scientific computing project.

> Seidel, Robert W. " 'Crunching Numbers': Computers and Physical Research in the AEC Laboratories." *History and Technology* 15 (1998): 31-68.
>
> "Significant article that analyzes the application of computers to problems in the physical sciences at various Atomic Energy Commission laboratories during the first two decades of the Cold War. More broadly, it indicates how the study of computers as scientific instruments can yield new understanding of the social, epistemological and theoretical commitments of modern science. The article details research in high-energy physics on lasers and particle accelerator projects, and the role of the computer. Among the computers and institutions he discusses are: Los Alamos National Laboratory, Rand Corporation, Argonne National Laboratory, AVIDAC, GEORGE, LARC, MANIAC, and Stretch."

From the perspective of the history of computing and software, this bibliography is an outstanding guide. The areas covered have not previously been attended to in other, readily accessible bibliographies. Assembled in one place, the indexes (both author and subject) make it possible to find the work of any number of practitioners and scholars, on a vast range of projects and systems, in one easy-to-use volume.

Fire Destroys Edinburgh University's Artificial Intelligence Library

In December 2003 Edinburgh University's Artificial Intelligence Library was destroyed in a major fire in the heart of Edinburgh's Old Town.

Among the many buildings destroyed or damaged by the fire was 80 South Bridge, home to a large part of the School of Informatics, including the Artificial Intelligence Library. The AI Library was built up over a period of 40 years, developed to support the University of Edinburgh as a world leader in the field of AI. Library collections comprised approximately 5,000 books, 800 journals, and 35,000 research papers published by the department.

BBC News interviewed AI librarian Olga Franks in the immediate aftermath of the fire. "I feel simply desperate," she said. "I was one of the original librarians in the department and I saw this work grow from the size of a cupboard to an immense library. It is still

sinking in that all of this material has gone. I can't really put into words how that feels. We've been trying to assess today what happens next. We have been meeting with other librarians to work out the value of the collection. And the one comfort is that a number of publishers are now putting their work online."

Since December, the Library Web site reports that m any offers of support and donations have been received from individuals and organizations worldwide. This support, together with a small collection of research material recovered from storage have provided a basis for work in rebuilding the collection – something the AI librarians have described modestly as "a considerable task."

Since December, library staff have accomplished a great deal of work in assessing what was lost, what can be replaced, and how best to go about achieving this. The development of online access to materials is being explored, and the Library's recent purchase of the ENCompass software is timely in further enabling management of digital resources.

In the meantime, Olga Franks and Janice Gailani, both of whom are responsible for managing the AI Library collections, are working hard to piece together an interim collection from items that have been donated, repurchased, or which have survived the fire. A Web page has been set up to provide details of interim Library support to those working in Artificial Intelligence, and is at:
http://www.lib.ed.ac.uk/news/aifire.shtml
Information on the School of Informatics fund-raising campaign is at
http://www.informatics.ed.ac.uk/emergency/library/

Inquiries about the AI Library should be directed to any of the following contacts:-
Olga Franks - Olga@inf.ed.ac.uk
Janice Gailani - JaniceG@inf.ed.ac.uk
Jenny Flemington - Jenny.Flemington@ed.ac.uk

Elisabeth Kaplan (with text provided by Jenny Flemington)

Recent Publications

Burks, Alice R. *Who Invented the Computer: The Legal Battle That Changed Computing History* (Amherst, NY: Prometheus Books, 2003).

Burton, Orville Vernon, ed. *Computing in the Social Sciences and Humanities* (Urbana: University of Illinois Press, 2002).

Campbell-Kelly, Martin. *From Airline Reservations to Sonic the Hedgehog: A History of the Software Industry* (Cambridge: MIT Press, 2003).

Copeland, Jack. *Colossus: The First Electronic Computer* (Oxford: Oxford University Press, 2003).

Eckdahl, Donald E., Irving S. Reed, and Hrant H. Sarkissian. "West Coast Contributions to the Development of the General-Purpose Computer: Building Maddida and the Founding of the Computer Research Corporation" *IEEE Annals of the History of Computing* 25:1 (January-March 2003): 5-33.

Ferry, Georgina. *A Computer Called Leo: Lyons Teashops and the World's First Office Computer* (London: Fourth Estate, 2003).

Head, Robert V. "Working in the House that FACT Built" *IEEE Annals of the History of Computing* 25:1 (January-March 2003): 60-64.

Hinds, Pamela, and Sara Kiesler, eds. *Distributed Work* (Cambridge: MIT Press, 2002).

Koss, Adele Mildred. "Programming on the Univac 1: A Woman's Account" *IEEE Annals of the History of Computing* 25:1 (January-March 2003): 48-59.

Kyriazopoulos, Panagiotis. "Creating an Electronic Commerce Marketing Strategy, for Small and Medium Size Firms with Particularization to Industrial Firms" *Archives of Economic History* 14:1 (January-June) 193-212.

Malecki, Edward J. The Economic Geography of the Internet's Infrastructure" *Economic Geography* 78:4 (October 2002) 399-424.

Reilly, Edwin D. *Milestones in Computer Science and Information Technology* (Westport, CT: Greenwood Press, 2003).

Slater, Robert. *The Eye of the Storm: How John Chambers Steered Cisco Through the Technological Collapse* (New York: HarperBusiness, 2003).

Williams, Michael R. and Erwin Tomash. "The Sector: Its History, Scales, and Uses" *IEEE Annals of the History of Computing* 25:1 (January-March 2003): 34-47.

Zygmont, Jeffrey. *Microchip: An Idea, Its Genesis, and the Revolution It Created* (Cambridge: Perseus, 2003).

CDC Newsletter Photographs
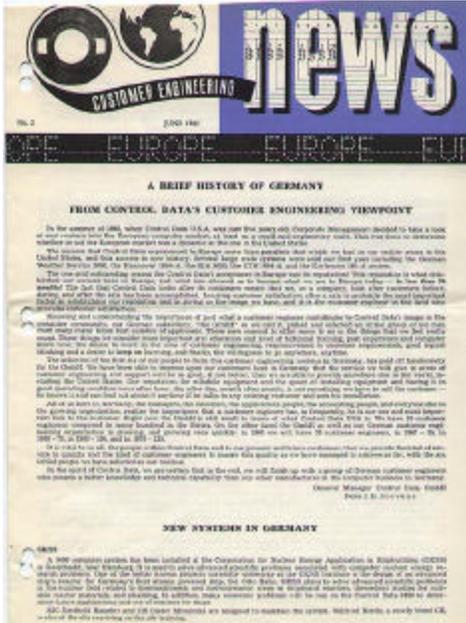
Customer Engineering News Europe, June 1965.
Customer Engineering News for European Control Data personnel
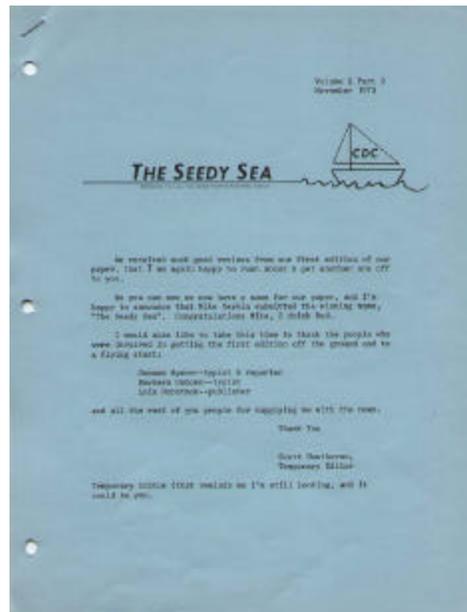
The Seedy Sea, November 1973.
Unlike largely circulated company newsletters, some publications
were hand-typed, smaller, and focused on a particular division or
department. The Seedy Sea (playing on the Control Data
Corporation acronym) was an employee-produced newsletter
"bringing you all the news that is floating about."

Contact, April 1980.
Contact was a newsletter(April 1980 shown here) for all Control Data
employees aimed at providing information about current management
objectives and strategies for the company, as well as a forum for
employee activities and achievements.

PLATO Password, July/August 1980.
A newsletter for Control Data employees involved in computer-based education. The purpose of the newsletter was to deliver news and information of company-wide interest, recognize marketing success, describe new marketing strategies, and announce or promote new products and features.
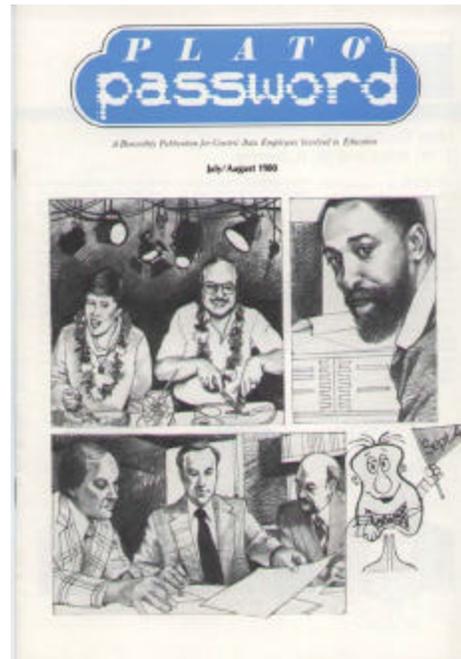
The SBC News, July 1963.
A marketing-focused newsletter for Service Bureau Corporation personnel. Service Bureau Corporation was an IBM subsidiary until Control Data acquired SBC as a result of an antitrust lawsuit against IBM. This issue of The SBC News (July 1963) is an example of an IBM era issue.

Control Data MLV (Marnes LaVallee), 1983.
This French-language newsletter informed personnel regularly of headquarters transfers to the Control Data Marnes LaVallee location.

Featured Photographs: Nixie Tubes

Nixie indicator tubes were first released as a product in 1956 by the Haydu Brothers of New Jersey, a subsidiary of the Burroughs Corporation. Designed for use in electronic display and readout, the first Nixies were small glass tubes filled with neon gas and a set of ten cathodes shaped as the numbers zero through nine. The cathodes were stacked on top of one another and when voltage was applied to an individual cathode, or number, it glowed through the top of the tube.

The first Nixie tubes had 0.6-inch characters and could be viewed from thirty feet away. Burroughs expanded the Nixie tube line to include different sizes and types of tubes. The line ranged from miniature tubes, with a character size of 0.3 inches and a viewing distance of fourteen feet, to jumbo tubes, with a character size of two inches and a

A Haydu Brothers advertisement for the Nixie tube, ca. 1956.

viewing distance of one hundred feet. The company also produced side-view tubes, rectangular shaped tubes, and segmented alphanumeric tubes.

Burroughs discontinued Haydu Brothers as a subsidiary and created its Electronic Tube Division at the former Haydu Brothers plant in 1956. Burroughs continued to

A Burroughs advertisement for the full line of Nixie tubes, ca. 1967.

manufacture and sell Nixie tubes through the Electronic Tube Division, and later the Electronic Components Division, through the 1960s and 1970s. The tubes were used in a wide variety of equipment, including digital tachometers, frequency counters, elevators, stock quotation displays, and missile countdown displays. LEDs supplanted Nixie tubes for ordinary display uses in the 1970s, but the tubes are still being used today. A recent article by Glenn Zorpette in the *IEEE Spectrum*, "New Life for Nixies," (June 2002, pp. 44-49) describes how hobbyists are using the tubes as creative digital clock displays.

Carrie Seib

Two views of an early Nixie tube.