CHARLES BABBAGE INSTITUTE

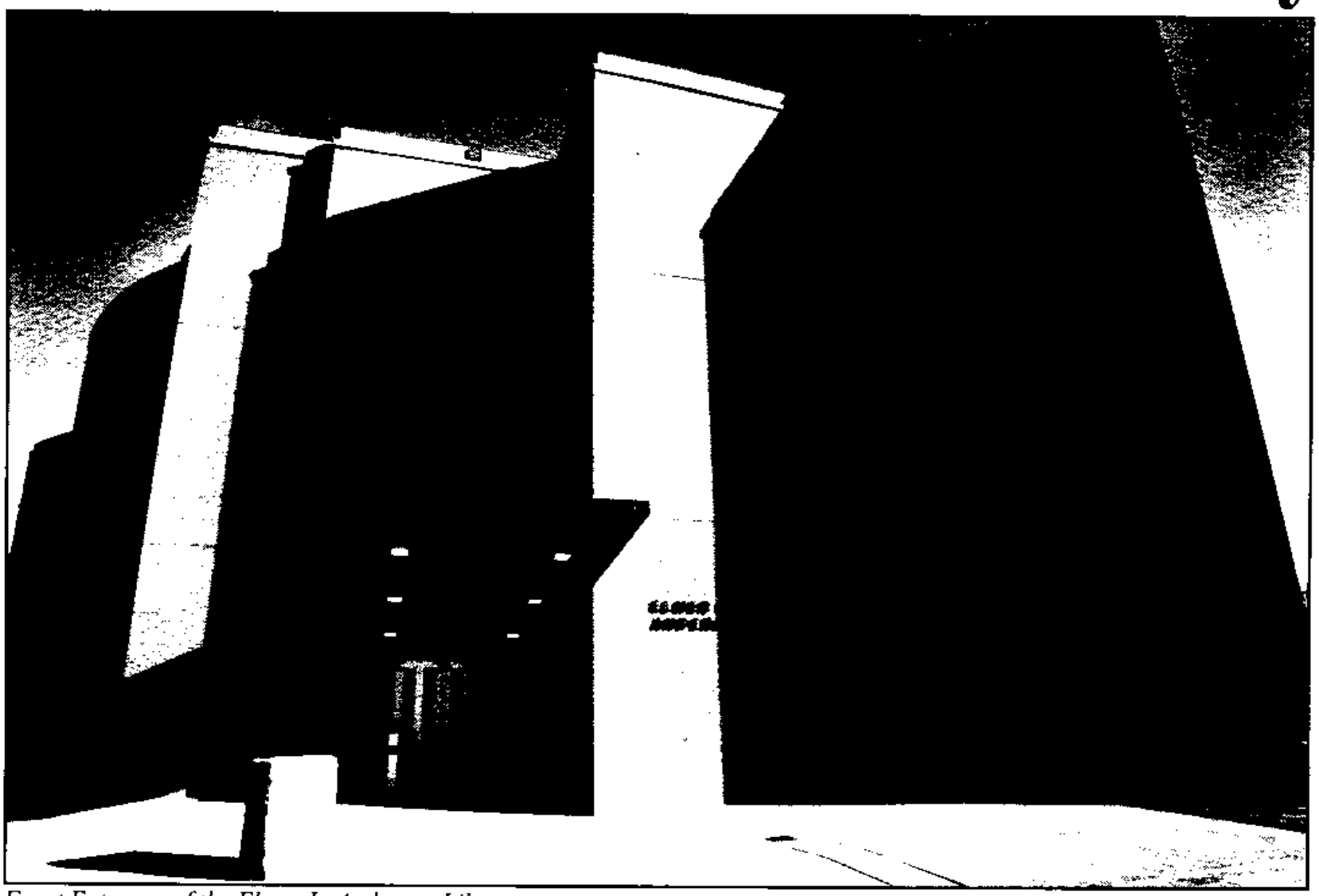
NEWSLETTER

Vol. 22 No. 2
Winter 2000

CENTER FOR THE HISTORY OF INFORMATION PROCESSING

Production of the CBI *Newsletter* is supported by the Charles Babbage Foundation

CBI Moves to Andersen Library



Front Entrance of the Elmer L. Andersen Library

At the beginning of February, the Charles Babbage Institute moved to its new home, the Elmer L. Andersen Library. Most of the funds for the construction of this approximately $46 million award-winning new building were provided by the Minnesota State Legisla-

Continued on page 4

CBI's New Address:

Charles Babbage Institute
211 Andersen Library
222 21st Ave. South
University of Minnesota
Minneapolis, MN 55455

CBI Software Conference in Palo Alto

CBI's software industry conference, focused on the emergence of the software product, will be held at the Xerox Palo Alto Research Center on the evening of Friday, September 22, and all day Saturday, September 23, 2000. The keynote speaker is Mr. Charles B. Wang, Founder, Chairman, and CEO of Computer Associates, Inc. The conference program will be included in the Spring issue of the CBI *Newsletter*.

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ICHC 2000 Web Site

The web site for "ICHC 2000: Map ping the History of Computing-Software Issues," a major international conference being held in Paderborn, Germany on April 5-7, 2000, is available at: http://www.hnf.de/ichc2000/

The conference is sponsored by the Heinz Nixdorf MuseumsForum and co-sponsored by the Charles Babbage Institute.

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Recent Publications

Birkenstock, James W. "Pioneering: On the Frontier of Electronic Data Processing, A Personal Memoir" *IEEE Annals of the History of Computing* 22:1 (Jan.-Mar. 2000) 4-47.

Castells, Manuel. "Materials for an Explanatory Theory of the Network Society" *The British Journal of Sociology* 51:1 (Jan.-Mar. 2000) 5-24.

Crowther-Heyck, Hunter. "George A. Miller, Language, and the Computer Metaphor of Mind" *History of Psychology* 2:1 (1999) 37-64.

Cusumano, Michael A. *Competing on Internet Time: Lessons from Netscape and its Battle with Microsoft* (New York: Free Press, 1998).

Dell, Debrorah A. *Thinkpad: A Different Shade of Blue* (Indianapolis: Sams, 2000).

Fenton, Norman E. and Martin Neil. "Software Metrics: Successes, Failures and New Directions" *The Journal of Systems and Software* 47:2-3 (July 1, 1999) 149-157.

Freiberger, Paul. *Fire in the Valley: The Making of the Personal Computer*, 2nd *ed.* (New York: McGraw-Hill, 2000).

Garr, Doug. *IBM Redux: Lou Gerstner and the Business Turnaround of the Decade* (New York: HarperBusiness, 1999).

Glass, Robert L. *Computing Calamities: Lessons Learned from Products, Projects, and Companies that Failed* (Upper Saddle River, NJ: Prentice Hall, 1999).

Graham, Lawrence D. *Legal Battles that Shaped the Computer Industry* (Westport, CT: Quorum, 1999).

Grier, David Alan. "Agricultural Computing and the Context for John Atanasoff" *IEEE Annals of the History of Computing* 22:1 (Jan.-Mar. 2000) 48-61.

Hobart, Michael E. and Zachery S. Chiffman. *Information Ages: Literacy, Numeracy, and the Computer Revolution* (Baltimore: Johns Hopkins University Press, 1998).

Hoch, Detlev J., ed. *Secrets of Software Success: Management Insights from 100 Software Firms Around the World* (Boston: Harvard Business School Press, 2000).

Lee, John A. N. "Howard Aiken's Third Machine: The Harvard Mark III Calculator or Aiken-Dahlgren Electronic Calculator "*IEEE Annals of the History of Computing* 22:1 (Jan.-Mar. 2000) 62-81.

Lewis, T. G. *Microsoft Rising--and Other Tales of Silicon Valley* (Los Alamitos, CA: IEEE Computer Society, 1999).

Margolis, Michael. *Politics as Usual: The Cyberspace "Revolution"* (Thousand Oaks, CA: Sage Publications, 2000).

Moody, Fred. *The Visionary Position: The Inside Story of the Digital Dreamers Who Are Making Virtual Reality a Reality* (London: Allen Lane, 1999).

Neuman, W. Russell. *The Gordian Knot: Political Gridlock on the Information Highway* (Cambridge, MA: MIT Press, 1998).

O'Rourke, Maureen A. "Progressing Towards a Uniform Commercial Code for Electronic Commerce or Racing Towards Nonuniformity?" *Berkeley Technology Law Journal* 14:2 (Spring 1999) 635-658.

Slater, Robert. *Saving Big Blue: Leadership Lessons & Turnaround Tactics of IBM's Lou Gerstner* (Boston: Irwin/McGraw-Hill, 1999).

Continued on page 7

CHARLES BABBAGE INSTITUTE
NEWSLETTER

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

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CBI Acquires Microfilm of Babbage Papers

The CBI archives has recently acquired a microfilm edition of the Papers of Charles Babbage held at the British Library. The twenty-two reels of film contain all of the Babbage papers from the British Library and are the only copies currently available for research in the United States.

Correspondence comprises the great majority of the collection. Drafts of Babbage's own letters are interspersed with letters from the international array of mathematicians, engineers, and inventors, as well as artists and writers, astronomers, economists, geographers, statesmen, and society figures with whom Babbage corresponded.

Also contained in the collection are Babbage's scientific papers including drafts and notes on astronomy, mechanical drawing, ciphers and deciphering, and investigations of the laws of the game of tic-tac-toe.

The microfilm edition was first published in 1997 by Adam Matthew Publications, Wiltshire, England. It is accompanied by a printed guide, which includes a biographical note, an extensive index to correspondents, a brief bibliography, and reproductions of selected manuscript materials held at the British Library.

Elisabeth Kaplan

Work on CBI's NHPRC Grant Complete

Microfilm of ENIAC Trial at CBI

The complete set of trial exhibits of Honeywell vs. Sperry Rand, otherwise known as the ENIAC Trial, is now available on microfilm for research at CBI.

In 1996, the National Historical Publications and Records Commission (NHPRC), an agency of the National Archives, provided grant funds to The Charles Babbage Institute, the University of Pennsylvania Archives, and the Hagley Library for a three year project to create and preserve on microfilm a master collection of plaintiff's and defendant's exhibits from the ENIAC trial. The trial records held at the three institutions contributed to the construction of this master collection, and each holds a copy of the microfilm edition of 211 reels.

The CBI archives holds 19 cubic feet of plaintiff's trial records that were donated to the Institute by Honeywell, Inc. in 1984. These records include trial and deposition testimony, photographs, newsreel footage, and other exhibits.

The ENIAC trial was a patent infringement and anti-trust suit pitting Sperry-Rand, which had bought the Eckert-Mauchly Computer Corporation, against Honeywell, which decided to test Sperry's claim to the patents on digital computing technology. During the discovery process, early materials on the development of electronic computing were collected by attorneys on both sides, and eventually found their way to the three institutions.

Described by historians as one of the best sources of information on early computing, the ENIAC trial records have been used extensively, leading to numerous publications. The University Archives and Records Center at the University of Pennsylvania administered the filming. Microfilm, which remains the most reliable archival storage format, was selected to preserve the collection after

Continued on page 6

History and Heritage of Science Information Systems

The latter part of 1999 saw the publication of the proceedings of an important conference on the history of science information systems held in Pittsburgh late the previous year. [Bowden, Mary Ellen, Trudi Bellardo Hahn, and Robert V. Williams, eds. *Proceedings of the 1998 Conference on the History and Heritage of Science Information Systems* (Medford, NJ: Information Today, Inc., 1999)].

The conference, conceived of by Arnold Thackray, President of the Chemical Heritage Foundation (CHF), was sponsored by CHF, the American Society of Information Science (ASIS), the Eugene Garfield Foundation and the NSF.

University of California, Berkeley Professor of Information and Management Systems Michael Buckland's conference overview pointed out that the history of information systems overlaps the history of science, the history of information systems, and the history of technology, and uses a broad range of methodologies and tools, from oral history, biography and archaeology to bibliometrics and infometrics. To meet the challenges of this complex, interdisciplinary field of inquiry, the background of the more than 20 program participants was necessarily diverse, and included historians and philosophers of science and technology, librarians, publishers, and information management specialists from both industry and academe. This facilitated a wide exploration of the contributions to, and uses of, information systems in different areas of the sciences, including biology, physics, chemistry, and medicine.

Of particular note were papers by four scholars focused on the history and historiography of science information systems.

Based upon his work chairing the Committee on Innovations in Computing and Communications: Lessons From History for a National Research Council study, University of Pennsylvania Professor Emeritus of History and Sociology of Science Thomas P. Hughes analyzed the early and continued role of the U.S. Government in financing information technology in his paper entitled, "Funding a Revolution." Hughes highlighted that the Federal Government not only advanced the U.S. computer industry in the 1950s through major projects like the Semiautomatic Ground Environment (SAGE), but also through federal agencies' (particularly DARPA, the NSF, and the ONR) subsequent and continued support for research in artificial intelligence, virtual reality, networking, relational databases, theoretical computer science, and very-large-scale integrated circuits. Overall, Hughes' analysis provides a strong argument for utilizing a historical approach in evaluating current and future policy alternatives.

Similarly, Timothy Lenoir, Professor in the History and Philosophy of Science at Stanford University, touched upon the role of federal funding of biological and medical research as he detailed key developments in a "paradigm shift" in molecular biology. In his paper, "Shaping Biomedicine as an Information Science," he documented the NIH's central role in this transformation through their sponsorship of research in computational chemistry and visualization technologies in the mid-1960s. Lenoir outlined how research such as the MOLGEN Project (Heuristic Programming) at Stanford in the 1970s was illustrative of the ways in which computer science and molecular biology were beginning to merge into bioinformatics. Lenoir also hinted at how the necessary skills and work environment of molecular biologists will likely change further, as the laboratories of the past increasingly are replaced by computer workstations and massive databanks of the future.

Continuing on the theme of the use and diffusion of scientific data, Bruce V. Lewenstein, a Cornell University Professor of Communications and Science and

Continued on page 6

CBI's New Facilities

Continued from page 1

ture. The building is named after the long-time supporter of the University of Minnesota, former Governor of the state, and collector of rare books.

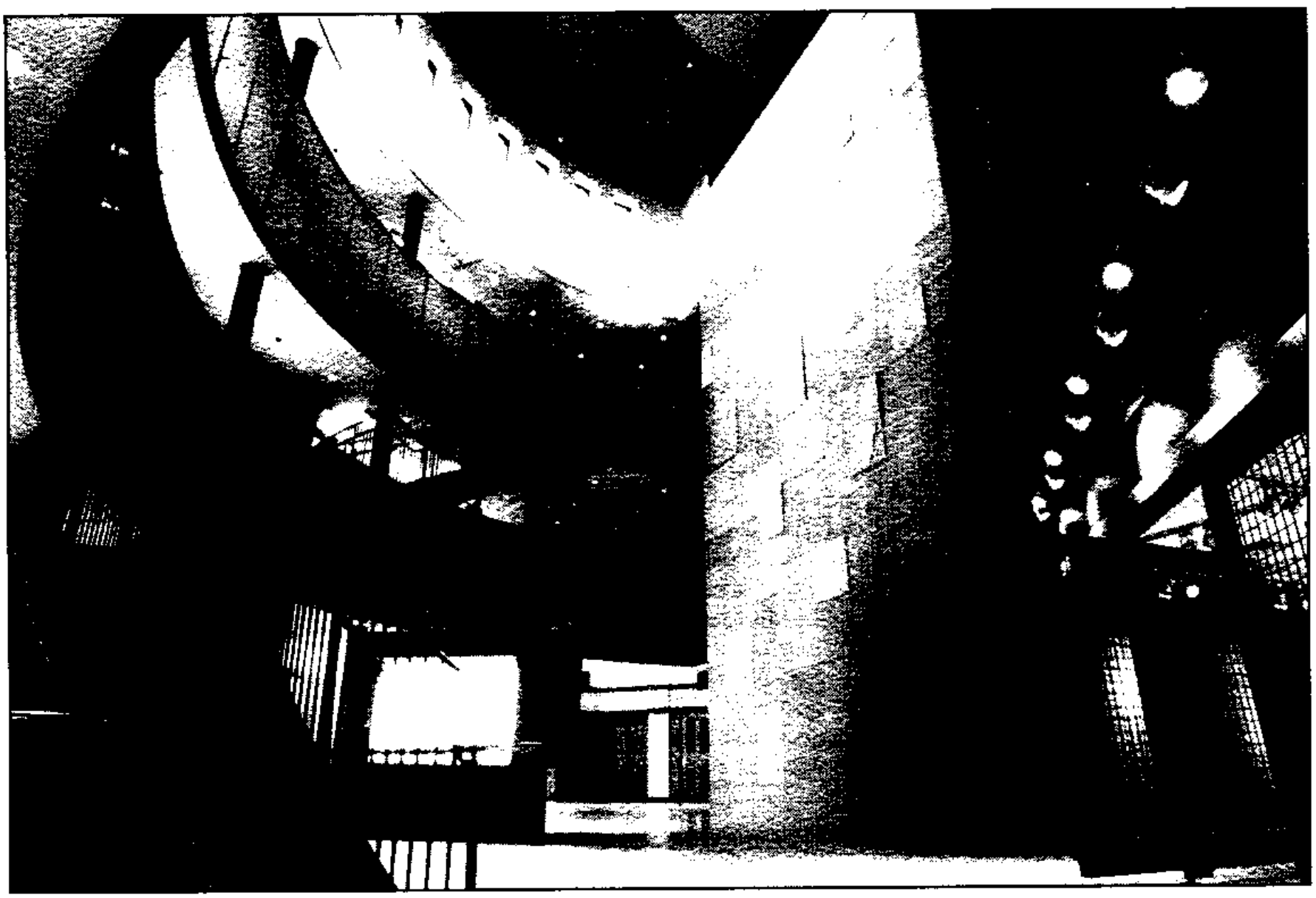
The Andersen Library provides the Institute with increased and greatly improved space for archival collections, offices, work stations, reference materials, processing, audiovisual equipment and meetings, as well as excellent research facilities for patrons.

Located on the west bank of the University of Minnesota campus, the second floor CBI suite in the Andersen Library offers breathtaking views of the Mississippi River and the cliffs and buildings on the east bank. Inside, the building's three-story atrium with curved wood balconies on the second and third floors, circular staircase, and interior stone wall provide the aesthete with an equally impressive sight (see photographs throughout this issue of the *Newsletter*).

The environment of the building's underground caverns is controlled to maintain optimal preservation conditions for the Charles Babbage Institute's archives. Most collections are kept on the sub-basement one level. Infrequently used materials are housed in an adjacent high-bay storage area, maximizing the utilization of space.

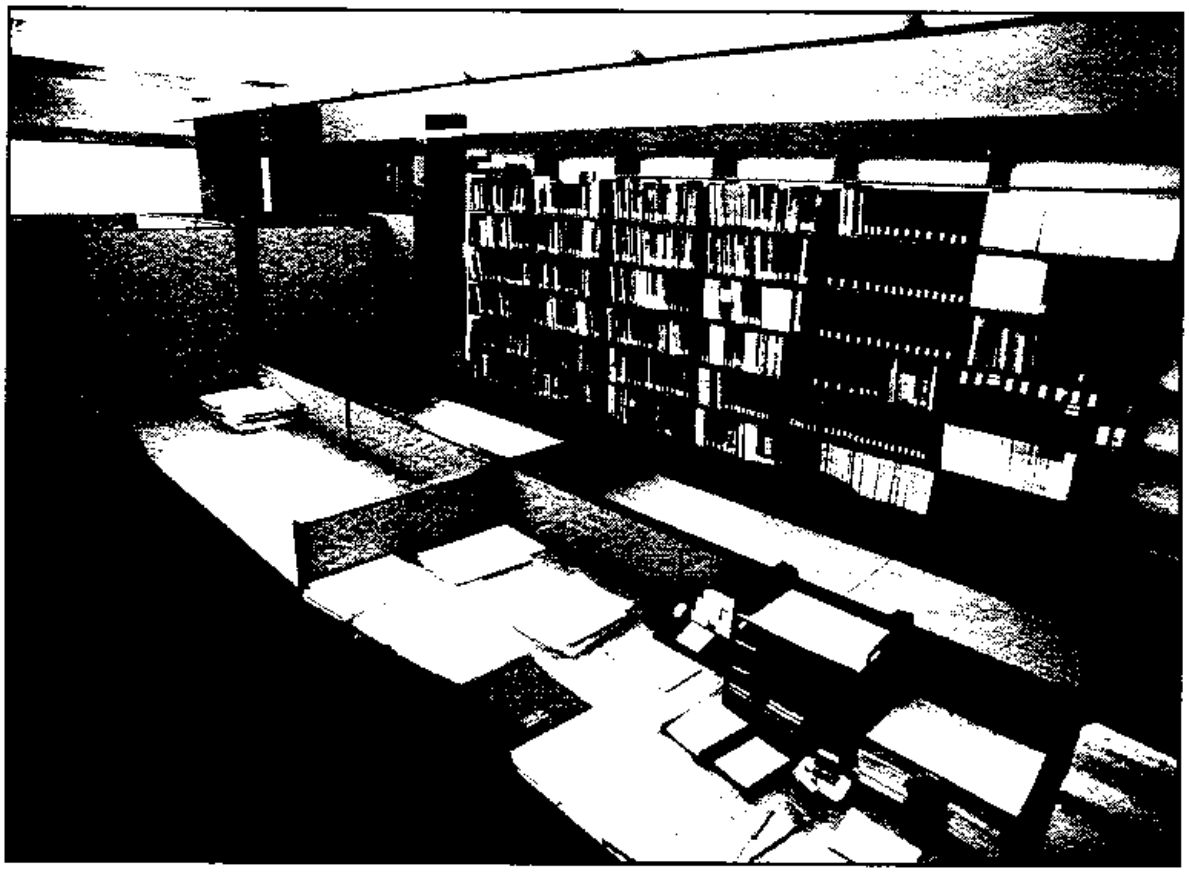
A large reading room for researchers is situated directly across the hall from the Institute's offices. This well furnished room is equipped with ports for internet connections at every table.

In addition to the Charles Babbage Institute, nine centers, archival units, or library service providers of the University of Minnesota are housed in the Andersen Library. These include: the Children's Literature Research Collection, Digital Projects Center, Immigration History Research Center, Manuscripts Division, MINITEX, Social Welfare History Archives, Special Collections and Rare Books, University of Minnesota Archives, and YMCA Archives.



The Atrium of the Elmer L. Andersen Library

The congregation of these centers and other library units will benefit the Charles Babbage Institute and patrons in a number of ways. The Andersen Library's many conference and meeting rooms will be available for the Institute. The audiovisual room will offer equipment and resources greatly exceeding those previously provided by any of the individual units.

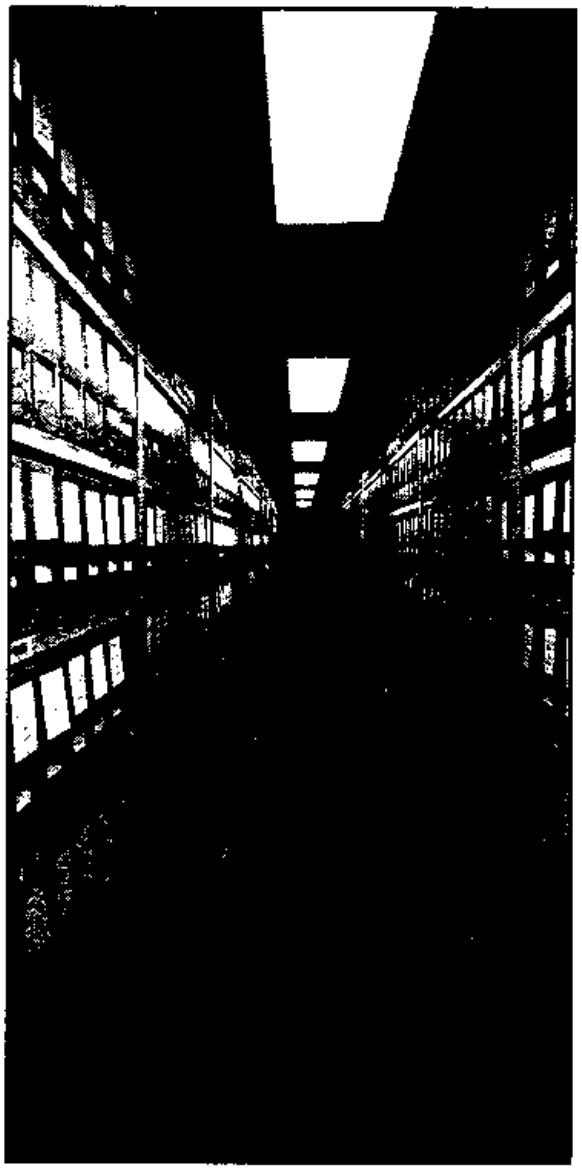


A View of the Main Room of the CBI Suite

Economies will also increase services. For instance, the retrieval of all materials from high bay storage facilities is contracted through the University (at no cost to CBI), thus relieving the staff of this task. Similarly, the Digital Projects Center's scanning services will expedite the increasing number of requests of CBI researchers for scanned images.

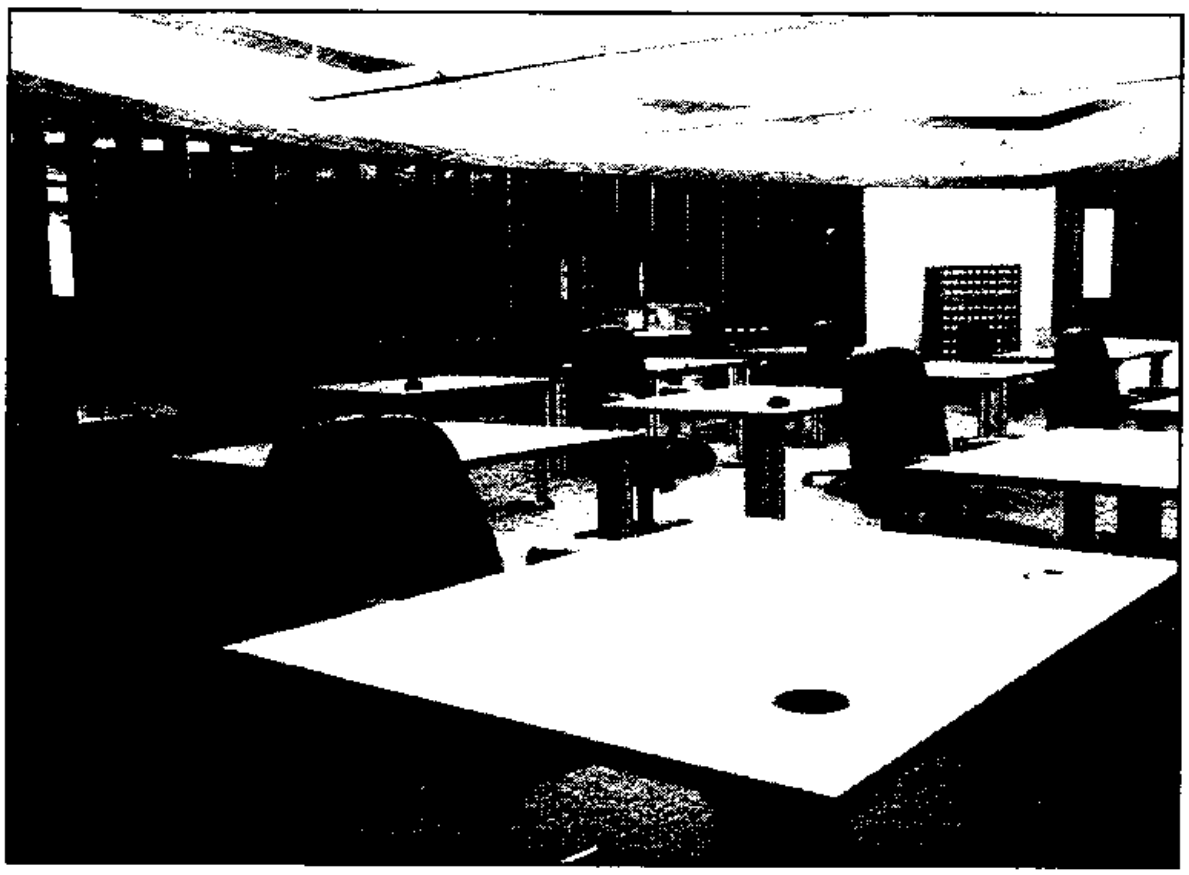
Bringing together the various research centers and archival units will also enhance the visibility of each, calling attention to the resources and services that they offer. In early April a series of open houses and related events will celebrate the new building, the generous support of Elmer L. Andersen to the University of Minnesota, and the important work and resources of the centers and units housed in the new library.

In conjunction with these events, the Charles Babbage Institute will have its own exhibit in the building's atrium, as well as contribute to a pictorial time-line with the other centers and archival units. CBI's archives staff researched, selected and provided captions for artifacts,



CBI Archival Collections in the Underground Caverns

photographs, advertisements, manuscript materials, and books to highlight aspects of Minnesota's early role in the computer industry (focusing on ERA and the Control Data Corporation) as well other important national developments in the history of information processing.



The Reading Room for Researchers using CBI Archives Collections

Continued on page 7

News From CBI Archives

Recent Acquisitions and New Material Available for Research

After an extended period of preparing the collections for CBI's move to the Andersen building, archives staff has begun accessioning and processing materials received over the past several months. Regular updates on recent acquisitions and materials newly available for research will be published in subsequent issues of the *Newsletter*.

A project to provide better access to CBI's collection of computer newsletters, serials, and other small publications was completed in January 2000. Many of these hard-to-find publications, which date from the 1970s-1980s, were produced only in single issues or limited runs by short-lived organizations and associations such as computer clubs and user groups. These important sources of information have been donated from various individuals and organizations, and CBI welcomes additions to the collection.

Two particularly notable new additions to the collection are described in detail elsewhere in the *Newsletter* (see pages 2 and 3). As usual, CBI is grateful to several individuals for their continuing donations to the archives' collections of obsolete computer manuals and product literature. Other acquisitions include a set of International Computer Programs (ICP) software directories which began publication in 1967; papers relating to the Honeywell vs. Sperry Rand patent trial, collected by Charles W. Bradley, an attorney involved in the case; materials from the Northwest chapter of DPMA; and conference materials from the Boole & Babbage User's Group (B-BUG).

Implementation of EAD

In February, the CBI archives began the first phase of implementation of Encoded Archival Description (EAD). Under development since 1993, EAD is now the recognized international standard format for electronic archival finding aids. EAD employs Standard Generalized Markup Language (SGML) to create a stable structure and storage format for the finding aids, which greatly enhances searching, retrieval, display, and exchange of information. Implementation is supported by the University Library's Digital Collections Unit and should be completed by early summer.

Elisabeth Kaplan □

Wilkes, Hoare, and Shirley Honored

In the recent honors list issued by Queen Elizabeth II on New Year's Day, Maurice Wilkes received a knighthood for services to computer science; Tony Hoare received a knighthood for services to computer science and education; and Stephanie "Steve" Shirley, founder of the FI Group and former president of the British Computer Society, was made a Dame of the British Empire for services to the IT industry. □

Microfilm of ENIAC Trial

Continued from page 3

digital imaging and electronic storage were deemed not cost effective or stable enough to suit the project's needs.

A guide to the complete collection and an extensive searchable database have been prepared by the Archives at the University of Pennsylvania and are available at:

http://www.archives.upenn.edu/FAids/ENIACtrial/ENIAC.html

Elisabeth Kaplan □

History of Science Information Systems

Continued from page 3

Technology Studies, analyzed different modes of information exchange within the scientific community in his case study of cold fusion research in the late 1980s and 1990s, "Fax to Facts: Cold Fusion and the History of Science Information." Lewenstein challenged traditional linear models (diffusion of laboratory studies to peer review to publication) of science and communication by demonstrating how instantaneous electronic communication (broadcast media, electronic mail and faxes) led to misinformation in the cold fusion case. Based upon his findings, Lewenstein supports the use of a non-linear, circular model of science information flow, where all forms of communication lead toward each other.

In contrast to Lewenstein's discussion of the relatively open diffusion of scientific information, University of Minnesota Chemical Engineering Professor Robert W. Seidel documented restricted scientific information flow at the Department of Energy and Department of Defense in his paper, "Secret Scientific Communities: Classification and Scientific Communication in the DOE and DoD." Seidel's research indicates that while efforts were made to share information within these closed communities (through classified journals, meetings of security cleared scientists, etc.), that the handling of scientific information within the secret community frustrated efforts at centralization of scientific information throughout the Cold War.

The papers by Hughes, Lenoir, Lewenstein, Seidel, and others not only illustrate the many different areas of important research on the history of science information systems, but also provide the groundwork for beginning to understand connections between them and furthering the understudied area of the history of scientific computing.

Jeffrey R. Yost □

New Home for CBI

Continued from page 5

Rear view of the Elmer L. Andersen Library

Artifacts in the CBI exhibit include: an Engineering Research Associates core memory plane (ca. 1950), a Control Data Corporation 1604 paper tape reader and writer (1960), a digital switching circuit designed by Seymour Cray (ca. 1959), Burroughs Corporation advertising materials and a Comptometer Adding Machine (ca. 1887). Among the numerous two-dimensional materials in the time-line are images of: Grace Murray Hopper (1985), Charles Babbage's Difference Engine No. 2 (as constructed by the Science Museum of London in 1991), the ENIAC (1946) and a geographic map of the nodes of the ARPA Networks (1975). Assisting with exhibit design and fabrication for CBI and the other centers and units is Larsen Design, a Los Angeles and Minneapolis based firm hired by University Libraries.

In addition to CBI's exhibit space in the atrium, there are display cases within and immediately outside the Institute's suite. All of these cases will be changed on a periodic basis to highlight the archives, research, and other projects of the Institute.

The Charles Babbage Institute is open at the Andersen Library and provides reference services to on-site and remote researchers between the hours of 9:00 a.m. and 5:00 p.m. on weekdays, as well as by appointment. Researchers are strongly encouraged to call the CBI archives prior to visiting the Institute.

All Andersen Building Photographs by Jonathan Chapman

Jeffrey R. Yost □

Recent Publications

Continued from page 2

Southwick, Karen. *High Noon: The Inside Story of Scott McNealy and the Rise of Sun Microsystems* (New York: John Wiley, 1999).

Spector, Robert. *Amazon.com: Get Big Fast* (New York: HarpersBusiness, 2000).

Tellioglu, Hilda and Ina Wagner. "Software Cultures" Association for Computing Machinery. *Communications of the ACM* 42:12 (Dec. 1999) 71-77.

Van den Ende, Jan. "Technological Transformations in History: How the Computer Regime Grew Out of Existing Computer Regimes" *Research Policy* 28:8 (November 1999) 833-851.

Yoffie, David B. and Michael Cusumano. "Building a Company on Internet Time: Lessons from Netscape" *California Management Review* 41:3 (Spring 1999) 8-28.

Yu, Albert. *Creating the Digital Future: the Secrets of Consistent Innovation at Intel* (New York: Free Press, 1998). □

Fifty Years Ago

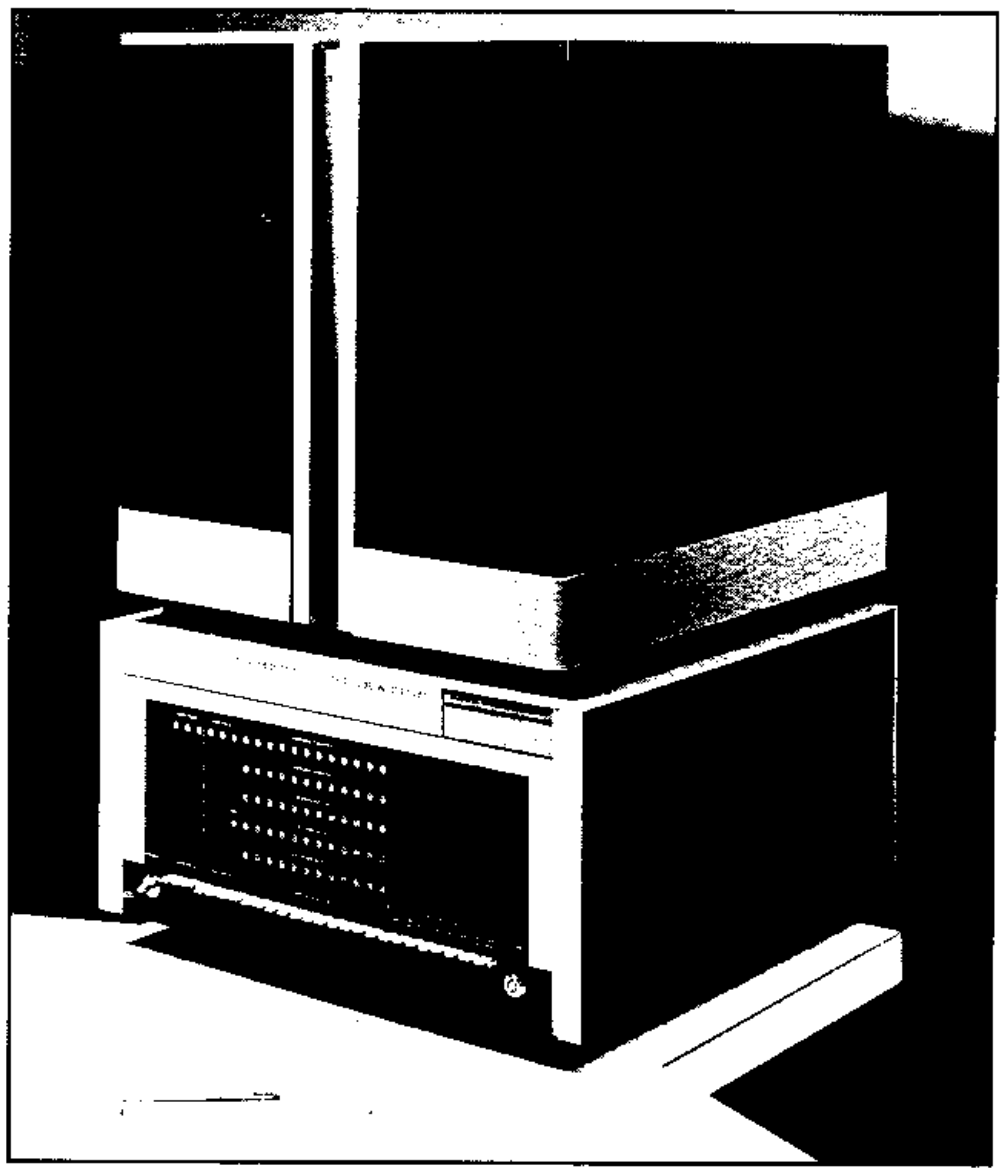
1950 saw the publication of *High Speed Computing Devices* by the Staff of Engineering Research Associates. This book resulted from an Office of Naval Research contract to ERA to assemble and publish information about the rapidly developing field of computing machinery. The book became an instant standard.

After five years of design and construction, the National Physical Laboratory's automatic computing engine (ACE) project saw success. The project, initially headed by Alan Turing, went through a series of design revisions. Turing's fifth design was simplified for construction as the Pilot ACE, which became operational in 1950.

35 Years Ago

Digital Equipment Corporation (DEC) introduced its 12-bit Programmed Data Processor, model 8, or PDP-8, on March 22, 1965 (see photo). DEC advertised the PDP-8 as "the lowest-cost full-scale computer currently available." It became known as one of the earliest minicomputers.

Lynn Leitte □



Digital Equipment Corporation's PDP-8

CHARLES BABBAGE INSTITUTE

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