

# CHARLES BABBAGE INSTITUTE NEWSLETTER

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CENTER FOR THE HISTORY OF INFORMATION PROCESSING

## Hurd Papers Document Early IBM Calculating Machines

Cuthbert C. Hurd formed the Applied Science Department when he joined International Business Machines (IBM) in 1949. The Department soon established a network of field representatives who canvassed major corporations, government units, and educational institutions about their computational needs for scientific applications. Field representatives assisted clients with programming applications for IBM equipment. They also worked with potential clients, helping to pave the way for future purchases and leases of IBM equipment.

These interactions are documented in a collection recently donated to CBI by Hurd. His files focus on the period from

1949 to 1952, and include trip reports by Hurd, memoranda about recruitment of the field staff and activities of the Applied Science Department, and reports regarding current and potential customers. The reports detail the type of problems that were run on the Card Programmed Calculator, the 602a, 604 electronic calculating punch, and other IBM machinery. The papers also document IBM's efforts and concerns leading to the development of the Defense Calculator, which later became the IBM 701. Most of the reports related to theoretical and applied scientific applications, but the Applied Science staff often made contacts concerning

*Hurd continued on page 4...*



*Cuthbert C. Hurd (second from the left) with a tour of RAND Corp. staff members on their visit to the IBM Poughkeepsie Plant #2 on October 10, 1950. (CBI photograph)*

## CBI on the Web!

CBI is pleased to announce the availability of a World-Wide Web (WWW) site relating to its programs. CBI created the site to provide greater access from any place in the world to information about the institute, its archival collections, and the history of information processing.

The Web is a network of intertwined hypertext documents that incorporates multimedia such as sounds, pictures and movies. These documents are available from many servers on the Internet, and are accessible to individuals with Internet access and a Web browser, such as Mosaic, Netscape, or Cello.

CBI established its Web in December 1994 using a server owned and supported by the University's Institute of Technology. Since that time CBI's archival staff has produced a broad range of hypertext documents including special features relating to the Burroughs Corporation Records, the DARPA/IPTO history project, the Minnesota computer industry, and a list of Hollywood movies that feature computers. In addition, CBI offers pointers to other Web and gopher sites related to the history of information processing.

One advantage of the Web over the Internet Gopher is its ability to highlight certain phrases that, when selected, refer to other documents, images, or Internet sites. For example, to move to the document describing the 25th anniversary of UNIX posted in the Amdahl WWW requires only a click of the mouse on the line listed in CBI's list of Web sites relating to information processing. The other advantage of the Web is its

*World-Wide Web continued on page 5...*

## Recent Publications

Menahem Blondeim, *News over the Wires: The Telegraph and the Flow of Public Information in America, 1844-1897*. (Harvard studies in business history, 42) Cambridge, MA: Harvard University Press, 1994.

Hans-Joachim Braun and Walter Kaiser, *Energiewirtschaft, Automatisierung, Information seit 1914*. (Propyläen Technikgeschichte, 5) Berlin: Propyläen Verlag, 1992.

Daniel I. Greenstein, *Historians' Guide to Computing*. New York: Oxford University Press, 1994.

Frank J. Swertz, ed. *From Five Fingers to Infinity: A Journey through the History of Mathematics*. Chicago: Open Court, 1994.

Richard Auzenne Valliere, *The Visualization Quest: A History of Computer Animation*. Rutherford, N.J.: Fairleigh Dickinson University Press, 1994.

John Von Neumann, *L'ordinateur et le cerveau*. Traduit de l'américain par

## CHARLES BABBAGE INSTITUTE NEWSLETTER

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Pascal Engel. Paris: La Découverte, 1992.

### Articles of Interest

George Buck and Steve Hunka, "Development of the IBM 1500 Computer-Assisted Instructional System," *Annals of the History of Computing*, 17:1(1995): 19-31.

Paul E. Ceruzzi, "Die frühen Arbeiten von Konrad Zuse im Kontext der Erfindung des digitalen Computers, 1935-1950," *Deutsches Museum, Wissenschaftliches, Jahrbuch 1992/93*.

Paul E. Ceruzzi, "From Batch to Interactive: The Evolution of Computing Systems, 1957-1969," *13th World Computer Congress 94*, 2 (1994): 279-284.

John A.N. Lee and Golde Holtzman, "50 Years after Breaking the Codes: Interviews with Two Bletchley Park Scientists," *Annals of the History of Computing*, 17:1(1995): 32-43.

Hartmut Petzold, "Mechanisierung und Automatisierung in der Rechenmaschinenteknik bis 1950 als Randbedingung für die frühen Arbeiten von Konrad Zuse," *Deutsches Museum, Wissenschaftliches, Jahrbuch 1992/93*.

Thomas M. Stout and Theodore J. Williams, "Pioneering Work in the Field of Computer Process Control," *Annals of the History of Computing*, 17:1 (1995): 6-18.

Nadie Weidman, "Mental Testing and Machine Intelligence: The Lashley-Hull debate," *J. Hist. Behavioral Science*, 30 (1994): 162-180.

William A. Whitaker, "Ada- the Project: The DoD High Order Language Working Group," *SIGPLAN Notices*, 28: 3 (1993): 299-331.

James C. Worthy, "Control Data Corporation: The Norris Era," *Annals of*

*Recent Publications continued on page 4...*

## Friends of the Charles Babbage Institute

CBI acknowledges the individuals and groups listed below for their support of CBI's programs through their membership in the 1995 CBI Friends Program.

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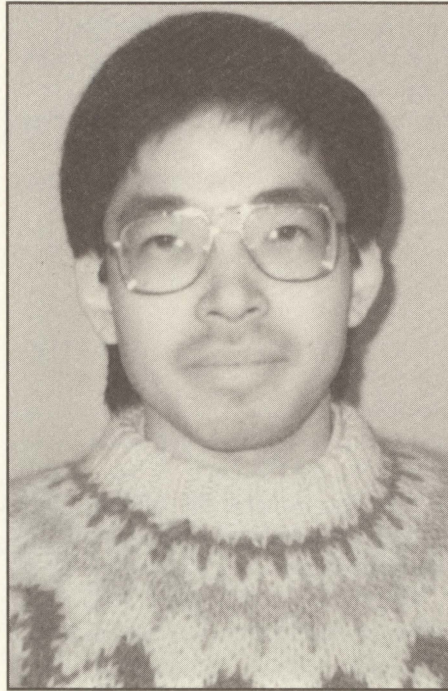
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## CBI Awards Tomash Fellowship for 1995-1996

The Charles Babbage Institute awarded the seventh Adelle and Erwin Tomash Fellowship in the History of Information Processing to Atsushi Akera. Mr. Akera is a Ph.D. candidate in the Department of History and Sociology of Science at the University of Pennsylvania. He received bachelor's degrees in computer science and in the Program in Science, Technology, and Society at the Massachusetts Institute of Technology in 1986 and a master's degree in the History and Sociology of Science at the University of Pennsylvania in 1994.

Mr. Akera will investigate the history of scientific computing in the United States. His study, which considers both the users and producers of scientific computing from the 1940s through the 1970s, addresses a particular case in postwar U.S. history where scientist and engineers, along with government and



Atsushi Akera

industry, collaborated in producing the foundations of a modern computing industry. Two themes are central to his dissertation. The first, the idea of selling the computer, suggests how the idea of computing won military contracts, created academic departments, and enlisted all kinds of specialists including physicists and electrical engineers. The second considers how users could influence computer designs, and how producers, in turn, brought new techniques to the sciences by introducing the computer as a scientific instrument. The story begins with the first general purpose electronic computer and concludes with the diffusion of computers into the life-sciences, when computers could be found throughout U.S. scientific laboratories.

Akera will spend part of the academic year at the Babbage Institute using records from several of its collections.

## Charles Babbage Foundation Names Six New Trustees

We are pleased to welcome six new Trustees to the Board of the Charles Babbage Foundation: Margaret Loftus of Loftus Brown-Wescott, Inc.; Saul Amarel, A. M. Turing Professor of Computer Science at Rutgers University; James W. Cortada of the IBM Consulting Group; Cuthbert C. Hurd, Chief Scientist of NorthPoint Software Ventures, Inc.; Harry Woolf, Professor and former director of the Institute for Advanced Study, Princeton; and William W. Wulf, AT&T Professor of Engineering and Applied Science at the University of Virginia.

Margaret Loftus developed software for the first Control Data Corporation supercomputers after joining them in 1965. In 1976, she joined Cray Research where she served as Vice President of Software Development, an organization that grew to 350 people world-wide. In 1989, she formed her current partnership with Judy Brown-Westcott. Loftus Brown-Wescott focuses on organization and individual change. Loftus also serves on the Board of Directors of Unimax System Corporation, Medical

Documenting Systems, Inc., The Works, Itasca Systems, Inc., and Analysts International Corporation.

Saul Amarel received his doctorate in electrical engineering from Columbia University, where he developed analytical methods and computational techniques for the study of linear and nonlinear systems. After two years as Group Leader for Systems Research in the Scientific Department of the Israeli Ministry of Defense, where he developed computer simulation methods, he became Head of Computer Theory Research at RCA Laboratories. There he organized and directed research in computer design, programming theory, and advanced applications and conducted some of the earliest studies in problems of representation and theory formation by computer. In 1969, he joined Livingston College at Rutgers, where he formed a Department of Computer Science. From 1985-1987, he also served as Director of the Information Science and Technology Office of DARPA.

Jim Cortada is a well-known author of the *Historical Dictionary of Data*

*Processing, Archives of Data Processing: A Guide to Major U. S. Collections, Before the Computer, and The Computer in the United States*, as well as numerous articles and books on management. As a member of the IBM Consulting Group, he also lectures and writes on quality management and business transformation. Cortada received his B.A. in History from Randolph Macon College and his M.A. and Ph.D. in History from Florida State University.

Cuthbert C. Hurd, who was invited to join the founders of the Charles Babbage Institute in 1979, but declined at that time because of his association with the Computer Museum, has at last consented to join the CBF Trustees. He received his Ph.D. in mathematics from the University of Illinois. After serving as Assistant Professor of Mathematics at Michigan State College, Educational Officer at the U. S. Coast Guard Academy, where he introduced IBM punched card machines, and Technical Research Head of Union Carbide and Carbon Corporation's Oak Ridge operation,

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## New Trustees

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where he applied punched card machines to the design of gaseous diffusion processes and commercial nuclear reactors, he became head of IBM's Applied Science Department where he was responsible for developing the Card Programmed Calculator, System 701, System 650, System 704, and the company's first software products. He initiated the Stretch Computer project and participated in the design and manufacture of the System/1701. After leaving IBM, he was Chairman of the Board of Computer Usage Corporation, one of the first software manufacturers, and of Picodyne Corporation, which developed courseware and educational networking for microcomputers. He founded Quintus Corporation which was acquired by Intergraph in 1989.

Harry Woolf received his Ph.D. from Cornell University in the History of Science in 1955. After rising from Assistant to Full Professor of the History of Science at the University of Washington, he was appointed Willis K. Shepard Professor of the History of Science at the Johns Hopkins University in 1961. In

1972, he became Provost of the Johns Hopkins University, and in 1976 director of the Institute for Advanced Study, Princeton, N.J., a post in which he served until 1987. His publications include *Transits of Venus* (1959, 1981), *Quantification* (1961), *Science as a Cultural Force* (1964), *Some Strangeness in the Proportion* (1980), and *The Analytic Spirit* (1981). He has served as editor of *Isis*, the *Sources of Science* series, and as associate editor of the *Dictionary of Scientific Biography*. He serves as trustee of Reed College, the Dibner Institute for the History of Science and Technology, and a number of other cultural, industrial and philanthropic organizations.

William Wulf received his Ph.D. in computer science from the University of Virginia in 1968, and subsequently rose from Assistant to Full Professor at Carnegie Mellon University, where his research spanned programming systems like the systems implementation language Bliss and the DoD programming language Ada, and computer architecture, including the architectural design of

the DEC PDP-11. In 1981, he founded Tartan Laboratories, which developed and marketed optimizing compilers. From 1988 to 1990, he was Assistant Director of the National Science Foundation, where he headed the Directorate for Computer and Information Science and Engineering, which oversees computer science and engineering research and operates the National Supercomputer Centers and NSFNET. While there, he developed the High Performance Computing and Communication Initiative and participated in the initiation of the National Information Infrastructure. Since becoming AT&T Professor at Virginia in 1988, Dr. Wulf has conducted research on computer architecture and security and is revising the undergraduate computer science curriculum. He also chairs the Computer Science and Telecommunications Board of the National Research Council. He is a member of the National Academy of Engineering, and a Fellow of the ACM, IEEE, and AAAS. □

## Hurd Donation

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business applications.

The detail of trip reports by Hurd and his field representatives offer an extraordinary glimpse of the state of the art at the beginning of the 1950s. A report filed on November 7, 1950, by J. Chancellor, who represented the Applied Science Department for the Chicago area, is indicative of the scope of information in the collection. The following is a list of contacts for that week:

*Wiebolt Stores:* Wiebolts planned to "turn to the 604 calculating punch to speed up their payroll calculations."

*Teletype Corporation:* The vice president of research felt that there were "not too many technical problems in his company which can be reduced to a mathematical model," but the company did have "elaborate problems in production control and cost accounting."

*Oak Park High School:* School officials had an interest in the use of IBM

equipment for class records.

*Armour Research Foundation:* Discussed a physical problem relating to boundary values and stress in a plate.

*University of Chicago, Department of Meteorology:* Contract called for data collection and processing at a cost of \$3,312.

*Argonne National Laboratory:* The report noted that Argonne staff "hopes to complete the new computer [the MANIAC] in 1951 but have not yet solved the problem of controlling the sequence of operations within the machine."

The Hurd Papers are open without restriction to interested researchers. The finding aid to the collection is posted on the CBI Gopher. Hurd plans further donations relating to his work with Computer Usage Company, Quintus Computer Systems, Inc., and other subjects. □

## Recent Publications

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*the History of Computing*, 17:1(1995): 47-53.

Klaus Wohlfarth, "Zur Rekonstruktion der Z3," in Kolloquium "50 Jahre programmgesteuerte Rechenmaschine," *Deutsches Museum, Wissenschaftliches Jahrbuch 1992/93*.

Lamont Wood, "The Man Who Invented the PC," *Invention & Technology*, 10:2(1994): 64.

Joanne Yates, "Co-evolution of Information-Processing Technology and Use: Interaction between the Life Insurance and Tabulating Industries," *Business History Review* 67 (Spring 1993): 1-51. □

*Production of this newsletter is supported by Analysts International.*

## Commercial Computer Museum Project

The Commercial Computing Museum Project, founded by Kevin Stumpf, is dedicated to the acquisition and preservation of artifacts and memorabilia from the commercial use of electronic, digital computers. The Museum Project, formerly known as the Unusual Systems Collection of Computer Control Panels and Consoles, will be located in Kitchener-Waterloo, Canada. Stumpf hopes it will be a place where people can go to be educated and entertained as they wander past static displays or participate in interactive displays that will exhibit and demonstrate both the tools and techniques of data processing and office automation. Rather than just highlight the machinery, Stumpf plans to recognize the importance of the people, processes, and procedures that harnessed and actually used the machines. In addition to the museum, Stumpf plans a repository of information, especially about Canadian companies, for the use of student and professional historians of computing technology.

Phase One of the museum will open in April 1996. In the meantime, Stumpf is displaying his collection in the window of the Waterloo Computer Book Store. "A Window to the Past" opened last June and will run through August 1995, with a new display each month.

For further information, contact Kevin Stumpf at 519 744-2900 or [stumpf@waterloo.hp.com](mailto:stumpf@waterloo.hp.com). □

## World-Wide Web

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ability to transmit images and graphics. CBI has used this feature to improve the display of information and to make popular images from its archival collections available at moderate resolution. The use of images is not limited to CBI's photographs, but includes graphics from printed archival material. Some pages of the Burroughs Corporation records use images taken from the B-Line (a

### When you move...

Please let us know your new mailing address. This will ensure your receiving the CBI Newsletter on a timely basis and also save us postage costs. Thank You.



*Bernice Fauteux of the Waterloo Computer Book Store with two of the computer panels displayed at the store. (Photograph courtesy of the Kitchener-Waterloo Record.)*

Burroughs newsletter), trademarks and logos, and advertisements. Because of the amount of time they add to calling and viewing a hypertext document, CBI has been conservative in its use of images on the Web.

Potentially, use of the Web could improve the quality of information in CBI's finding aids, which are currently accessible on the Internet through CBI's Gopher. The use of images and direct references to other archival information holds much promise for changing the staid archival finding aid to a dynamic indexing tool. CBI has reformatted some of its finding aids as hypertext documents

with good results. However, documents in this format are not accessible to those without access to a Web client. Thus, those individuals having only a Gopher client would not be able to use these aids. Until this situation changes, CBI will continue to post finding aids on the CBI Gopher, with appropriate references from its Web site. In the meantime we will continue to experiment with hypertext finding aids.

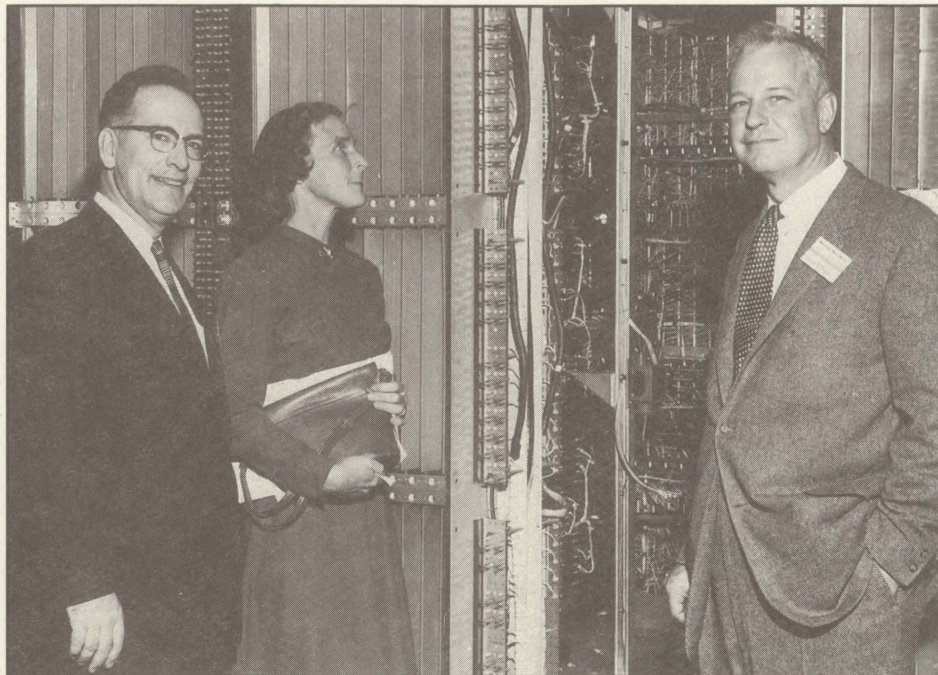
CBI is working with the Office of the Institute of Technology Dean to explore enhancements to CBI's Web, including the use of "computer forms," which

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## World-Wide Web

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support immediate feedback from users, and image mapping, which allows areas of a picture to refer to other information. Another obvious enhancement to the Web is to post archival documents for immediate research use. While CBI has experimented with this concept (particularly with images), a number of factors suggest a "go slow" approach. First is the issue of copyright; while CBI holds such rights to most of its holdings, a significant part could not be posted on the Internet without infringing on copyright. Second is the cost; CBI cannot afford massive scanning of archival materials and preservation of the digital files. Third, there is no acceptable method on the Internet to charge a fee to cover the cost of maintaining files and supporting other work. For example, CBI could post transcripts on the Internet, but we could no longer recoup the fee assessed for transcripts that helps cover part of the cost of transcribing and cataloging oral history interviews. These issues are shared by all archives on the Internet, and are



*John Mauchly, Kay Mauchly, and Arthur Draper in front of the Livermore Automatic Research Calculator (LARC), ca. 1955, from CBI's photograph collection. This and other images from the early computer industry can be found in a virtual photo gallery on CBI's World Wide Web.*

likely to be resolved over time. Currently the CBI Web site is at: <http://fs1.itdean.umn.edu/cbi/cbihome.htm>

Suggestions and comments about the web are welcome and should be directed to the CBI Archivist.

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