

Lécuyer is 1996-7 Tomash Fellow

CBI has awarded the eighth Adelle and Erwin Tomash Fellowship in the History of Information Processing to Christophe Lécuyer, a Ph.D. candidate with Timothy Lenoir in the Program in the History and Philosophy of Science at Stanford University.

Previously he studied at the École Normale Supérieure in Paris, and received his bachelor's and master's degrees in history from the Sorbonne. He has lectured at MIT and Boston College. Lécuyer has published "MIT, Progressive Reform, and Industrial Service, 1890-1920," and "The Making of a Science-Based Technological University: Karl Compton, James Killian, and the Reform of

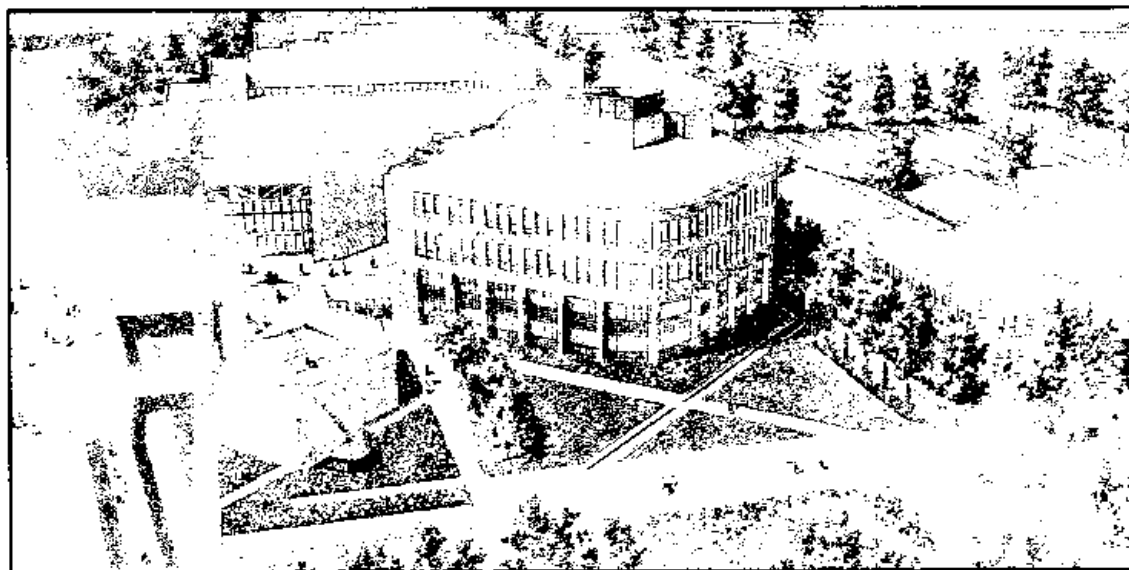


Christophe Lécuyer

MIT, 1930-1957," in *Historical Studies in the Physical and Biological Sciences*, and "Instrument Makers and Discipline Builders: The Case of NMR," in *Perspectives on Science* with Timothy Lenoir.

His dissertation, "Shaping Cold War Regional Economies: The Military, Electronics Manufacturing, and the Rise of Silicon Valley, 1948-1972" focuses on the semiconductor and microwave tube

Archives Building Funded!



The Minnesota Library Access Center will be located on the West Bank campus of the Twin Cities Campus of the University of Minnesota, and will house the Charles Babbage Institute and its historical collections.

The Minnesota Legislature approved \$38.5 million for the construction of a new home for the Charles Babbage Institute, the Minnesota Library Access Center. The building's mined storage area will double CBI's storage space and provide a state-of-the-art environment for the archives, and the new office space will vastly improve research and processing areas. It will also house the Information Processing Hall of Fame, which CBI will launch this fall.

industries, and examines how the military and groups of engineers and entrepreneurs shaped the emergence of new process technologies and systems of production in Silicon Valley. His analysis seeks better understanding of the relations between military procurement and technological change in manufacturing, and the impact of electronics manufacturing on the computer industry. □

Legislative endorsement was by no means assured, although the University of Minnesota gave the MLAC highest priority in its construction budget. The Minnesota House eliminated the building from its request, but the Governor and the Senate backed its construction. With the help of sympathetic legislators, archivists, curators, and considerable lobbying (including by Charles Babbage Foundation President Willis K. Drake and other CBI board members), the funding was reinstated in the conference committee.

Stageberg, Byer, and Sachs Architects of Minneapolis have completed a two-year planning effort, involving library planners, archivists, and curators. It will house the University of Minnesota's archives and special collections, including the CBI and its collections. Construction begins this fall, and is scheduled for completion in 1998. □

Moore School Lectures' 50th Anniversary

Historians of computing gathered at the University of Pennsylvania on May 19-20 to celebrate the 50th Anniversary of the Moore School Lectures. Tomash Fellow Atsushi Akera, who handled local arrangements, and CBI Director Bob Seidel, who chaired the program committee, welcomed them to the symposium.

Former Tomash Fellow Janet Abbate compared ARPANET to the Mark I project at England's National Physical Laboratory, where packet-switching was independently developed by Donald Davies in 1965.

Former Tomash Fellow Pat Hemmis showed how the computer industry co-opted metaphors associated with products ranging from automobiles to clothing to market computers. Metaphors helped conceptualize, mediate and influence the relationship between the electronic computer and humans.

In other papers, Paul Edwards argued that efforts to build global models and their corresponding data sets were a direct result of military efforts.

CHARLES BABBAGE INSTITUTE NEWSLETTER

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

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Abdelkerin Ousman described the failed attempt to build the European UNIDATA system in the 1960s as a result of NATO's efforts to standardize computers.

Dan Holbrook traced the idea of integrated circuitry to electronic projects in World War II, especially the proximity fuse. The military need for reliable, small packaging spurred transistorization and facilitated modular designs like the monolithic ICS.

Lars Heide described the early punch card systems of John Shaw Billings, Herman Hollerith, John Gore, Charles Pidgin, and James Powers, and concluded that although these inventor-entrepreneurs were essential, lead users like the Bureau of Census and insurance companies were important for inspiration as a customers.

Teri Hopper argued that cultural categories like gender combined with strategy and technology to form a labor process that solved critical problems of computation in business, government and scientific work in early 20th century

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Recent Publications

Bauer, Walter F., "Informatics: An Early Software Company," *IEEE Annals of the History of Computing* 18:2 (1996): 70-76.

Cortada, James W., "Commercial Applications of the Digital Computer in American Corporations, 1945-1995," *IEEE Annals of the History of Computing* 18:2 (1996): 18-29.

Daston, Lorraine, "Enlightenment Calculations," in *Critical Inquiry* 21:1 (Autumn 1994): 182-202.

Edwards, Paul N., *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge: The MIT Press, 1996).

Lee, John A. N., "Those Who Forget the Lessons of History Are Doomed to Repeat It, or Why I Study the History of Computing," *Annals of the History of Computing* 18:2 (1996): 54-62.

Morris, R. J., "Electronic Documents and the History of the Late 20th Century: Black Holes or Warehouses? What do

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Cuthbert Hurd



CBI Trustee Cuthbert Hurd passed away on May 22nd in Portola Valley, California at the age of 85. Hurd received his Ph.D. in mathematics from the University of Illinois, and served as assistant professor of mathematics at Michigan State College, Educational Officer for the U. S. Coast Guard Academy in World War II, and Technical Research Head of Union Carbide and Carbon's Oak Ridge facility from 1946-1948, where he applied IBM punch card technology to nuclear problems.

In 1948, Hurd 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 IBM's first software products. He also initiated the Stretch Computer project, and worked on the design of the System/1701.

After leaving IBM, he became Chairman of the Board of Computer Usage Corp. and Picodyne Corp., founded Quintus Corp., and at the time of his death was chief scientist of Northpoint Software Ventures, Inc.

Dr. Hurd donated his papers to CBI in 1995. They focus on his years at IBM from 1946-55, and at Quintus from 1984-89.



Production of this newsletter is supported by Analysts International.

Computers and "the Systems Approach"

CBI Associate Director Stephen Johnson presented "From Concurrency to Phased Planning: An Episode in the History of Systems Management," at the conference *The Spread of the Systems Approach* at MIT's Dibern Institute, May 3-5. The conference, organized by Tom Hughes, featured papers on the history of operations research, systems analysis, engineering, and management.

Johnson's paper described the Air Force creation of a managerial control system for costs and schedules that became the basis for DOD and NASA R&D management.

Tomash Fellow Atsushi Akera's talk, "Computers and Systems Analysis: Transforming Research Strategies at the National Bureau of Standards" described the prominent role of systems analysis in the NBS' development of the Univac and the SEAC.

Donald McKenzie's investigation of computer and software safety showed that from the 1968 NATO conference on Software Engineering onward, experts recognized that software presented difficult specification and design problems. Mike Mahoney's commentary emphasized the relationship between software complexity and the problems encountered in creating a discipline of software engineering.

Paul Edwards presented "The World in a Machine: Origins and Impacts of Early Computerized Global Systems Models." He described the role of computers in creating the models that form the scientific basis for study of weather prediction, climate, global ecology, global population, economics, and resource use. Jay Forrester's commentary noted that Industrial Dynamics models do not rely upon the large quantities of data needed in other models, but focused on the relationships between global processes.

Papers from the conference are planned for publication by University of Chicago Press.



Monticello Memories

An exciting new partnership has been formed by CBF Trustee Patrick McGovern of the International Data Group and Computerworld, and David Allison of the Smithsonian Institution. The Monticello Partnership brings together these organizations, with Robert Frankenberg of Novell, Inc., Scott Kauffmann of Price Waterhouse, and historians Bob Seidel of CBI and Bill Aspray of the Computer Research Association in the Monticello Memoirs program. Institutional support has also been provided by the University of Virginia and the Monticello Foundation.

Founders Jay Forrester, Robert Metcalfe, Gordon Moore, Gordon Bell, and Seymour Cray met with the partners and with James Martin, author of *The Wired Society* and *The Great Transition*, at Keswick Manor on April 30-May 2, to discuss the effect of Thomas Jefferson's values upon their careers, the social implications and future of the Information Age and the Internet.

Their conversation will be recorded at the Smithsonian Institution. A variety of media are under consideration, including edited audio- and videotapes, still photography by Tom Lippert, and The Innovation Network, Novell's World-Wide Web site.

Private meetings were followed by a tour and a dinner for the Monticello Partnership Fellows and Partners. On May 1, they gave public lectures at the University of Virginia.

Seymour Cray asked the question, "When Will Computer People and Molecular Biologists Get Together?" in his talk. He stated that after 50 years, computers have not transcended the mathematical functions of ENIAC, and there has been little conceptual progress. Unlike biological systems, which recognize patterns and have associative memory, we do not have a machine that can think today. As the Big Blue-Kasparov match showed, after his initial loss in his recent match with IBM's super-computer, Kasparov thought and Big Blue didn't. Computers might achieve pedaflop per second performance in 20 years, but they then run up against the uncertainty principle and other physical limits.

Cray described a human cell using DNA for DRAM--48 chromosomes providing 6 gigabits of memory--10% in program code with 150,000 genes or subroutines. Of this,



Keswick Manor, Site of Monticello Partnership Meetings

just over 50% is the operating system that requires 13 years to initialize. If all goes well, you get a smiley face!

The microprocessors--ribosomes--have two levels of memory cache: the L2 memory or RNA and the L1 memory or t-RNA which moves 6 bits at a time to generate protein molecules. They generate more than 20 amino acids by manipulation of genetic material. The Krebs cycle supplies energy similar to AC/DC power supplies. Cray suspects that each cell contains a life force for control, because control circuits are not apparent.

David Allison lectured on "The Information Revolution in Jefferson's America," Gordon Moore on "The Innovation Boom in Silicon Valley," Bob Metcalfe on "The Internet After the Fad," Gordon Bell on "A New Way to Work: Current and Anticipated Effects of Information Technology," and James Martin on "Information Technology and the 21st-Century Corporation."

The fellows met before a packed audience to discuss "The Social Impact of Information Technology" in a panel moderated by Martin. While Cray hoped communication over the Internet would decrease nationalism, and thought society needed a challenge against which to struggle, Forrester submitted that the common enemy is ourselves and social and political systems. Bell saw flattening of organizations as a precursor to the flattening of the world economy, and the trade deficit as a great

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Recent Publications...

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Historians Really Want?," in *Electronic Information Resources and Historians: European Perspectives* (St. Katharinen: Scripta Mercaturae, 1993): 302-316.

Mounier-Kuhn, Pierre-E., "Un exportateur dynamique mais vulnérable: la Compagnie des Machines Bull (1948-1964)," *Histoire, Economie et Société* 4 (1995): 643-665.

Norberg, Arthur L., "Changing Computing: The Computing Community and DARPA," *IEEE Annals of the History of Computing* 18:2 (1996): 40-53.

O'Neill, Judy E., "'Prestige Luster' and 'Snow-Balling Effects': IBM's Development of Computer Time-Sharing," in *IEEE Annals of the History of Computing* 17:2 (1995): 50-54.

O'Neill, Judy E., "The Role of ARPA in the Development of the ARPANET, 1961-1972," in *IEEE Annals of the History of Computing* 17:4 (1995): 76-81.

Oldfield, H. R., "General Electric Enters the Computer Business--Revisited," in *IEEE Annals of the History of Computing* 17:4 (1995): 46-55.

Otnes, Bob, "Thacher Notes," in *Journal of the Oughtred Society* 2 (1993): 21-25.

Packard, David, *The HP Way*, (Prince Frederick, Maryland: Recorded Books, 1995).

Perry, Tekla S., "E. David Crockett," in *IEEE Spectrum* 30 (Oct. 1993): 62-65.

Polachek, Harry, "History of the Journal *Mathematical Tables and other Aids to Computation*, 1959-1965," in *IEEE Annals of the History of Computing* 17:3 (1995): 67-74.

Price, Osborne I., "Keuffel and Esser Patents," in *Journal of the Oughtred Society* 2 (1993): 34-37.

Price, Osborne I., "The Rare K and E4110, An Improved Mannheim Rule," in *Journal of the Oughtred Society* 2 (1993): 26-27.

Pugh, Emerson W., and William Aspray, "Creating the Computer Industry," *IEEE Annals of the History of Computing* 18:2 (1996): 7-17.

Purbrick, Louise, "The Dream Machine: Charles Babbage and His Imaginary Computers," in *Journal of Design*

Records of American Business Debated in St. Paul

CBI archivist Bruce Bruemmer presented "Avoiding Accidents of Evidence: Functional Analysis in the Appraisal of Business Records," at the Symposium on the Records of American Business, held in Saint Paul on April 12. He argued for analysis of business functions as a key to selecting and appraising historical documentation.

He noted that with the increasing use of electronic records, the role of collecting repositories may become limited. JoAnne Yates of MIT's Sloan School commented on Bruemmer's presentation. She pointed out the benefits of different collecting practices that provide diversity of sources for historical research.

The conference, the first on the subject in ten years, saw over 100 archivists and historians share strategies for the acquisition and appraisal of business records by public repositories and corporate archives. It was sponsored by the Hagley Library and the Minnesota Historical Society and funded by the National Endowment for the Humanities.

Presentations covered the selection and appraisal of business records, the use of external documentation, and the roles of collecting repositories and corporate archives. The relationship between organizational structure, business functions, and the types of records generated was one of the important issues of the conference.

Whether public repositories or corporate archives do a better job of documenting business prompted a spirited debate. Papers written for the conference, as well as other invited papers, will be published next year by the Society of American Archivists. □

History 6:1 (1993): 9-21.

Ross, Floyd E., "Forging FDDI," in *IEEE Journal on Selected Areas in Communications* 11 (Feb. 1993): 181-190.

Rutland, David, *Why Computers are Computers: The SWAC and the PC*, (Philomath, Oregon: Wren Publishers,

Monticello...

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danger. Teleworking holds the danger of social dislocation.

Metcalf argued that the communications bandwidth doubles every 100 years (Groves' Law) and suggested that telecommunications be demonopolized through antitrust laws, then deregulated. He believes that freedom of communication is technically possible but politically undesirable for most governments. Gordon Bell testified that fear and entrepreneurship are two motivators, and that universities are sources of ideas, personnel, and enterprise.

In the closing banquet held in the dome room of the rotunda, CBF Trustee Bill Wulf argued that the university has changed in its mission about every 50 years. Another major change is in the offing: the electronic academic village is replacing the eroded Jeffersonian community, extending the interest and depth of the interactions of the academic village in a more egalitarian way.

The Monticello Partnership plans future meetings in Geneva and at Monticello to enroll new fellows in the search for understanding of the Information Age. □

Errata

The woman in the photograph on page 6 of the Winter 1995 *Newsletter* (17:2) is Sally Draper, not Kay Mauchly. Our thanks to James McNulty for calling this error to CBI's attention and supplying the correct identification.

In the last newsletter, Barkeley Fritz's paper delivered to the historical symposium in commemoration of the 50th Anniversary of the ENIAC was entitled "The World at the Beginning of the Information Age" and was presented in the session, "The Army, the National Need and ENIAC." □

1995).

Schaffer, Simon, "Babbage's Engines and the Factory System," in *Critical Inquiry* 21:1 (Autumn 1994): 203-227

Shurkin, Joel, *Engines of the Mind:*

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Moore School...

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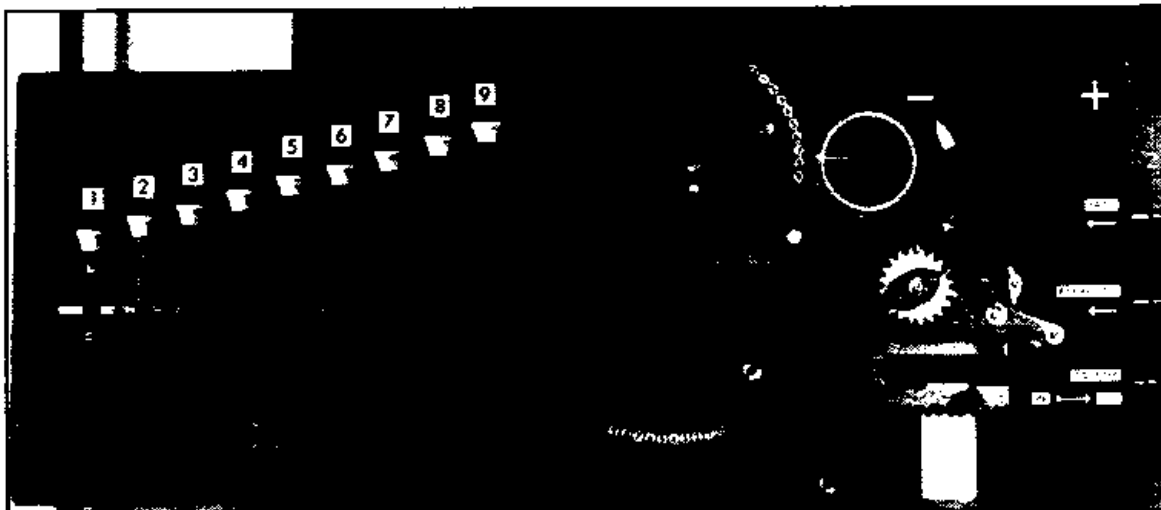
America. Aristotle Tympas maintained that the assumption of discontinuity between contemporary and pre-war computing technology overlooks a continuity between the analog and the digital in the ideology of intelligent machines. Colin Burke suggested that wartime cryptographic organizations did not invent the electronic digital computer because they were too pressed to experiment with it.

Eda Kranakis and Brian Locking used a multivariate analysis of technological, economic, social, and political data to analyze why the Japanese prevailed over Western Europe in the computer market. Seiichiro Yonckura gave credit to Japan's industrial policy and its absorptive capacity for technology as illustrated by the positive response to ENIAC when Fujitsu got a copy of its blueprints. Pierre Mounier-Kuhn argued that computers were not developed by the French electrical industry until the late 1950s, when IBM entered the market and French companies acquired US licenses. Richard Coopey discussed the relative decline of the British computer industry, including the National Research Development Corporation, which funded innovative technologies such as the Williams Tube, and the Ministry of Technology, which saw the computer industry as a first priority. This attempt to restore Britain to industrial leadership failed. Anthony Gandy compared the efforts of established British and American electronics companies to enter the commercial computer market. Dirk de Wit completed the tour of the computer industry with an account of Philips and Electrologia.

Finally, Anne Fitzpatrick presented an analysis of the role of the computer in designing nuclear weapons, and Atsushi Akera described Cuthbert Hurd's marketing of scientific computers.

The Moore School Lectures created an opportunity to launch the digital computer. This conference pointed the way to new problems and prospects in the history of computing and information processing. □

ENIAC Trial Records to be Filmed



A photograph of Plaintiff's Trial Exhibit 27, used in 1971 during Robert E. Mumma's testimony in the *Honeywell v. Sperry Rand* trial to explain the workings of a calculator. The model was built at the end of World War II by NCR engineers to train salesmen and servicemen in the use and maintenance of the NCR 3000 bookkeeping machine. This and other court exhibits will be microfilmed under a special grant from the NNHPRC. (CBI archives)

The National Historical Publications and Records Commission (NHPRC), an agency of the National Archives, has granted \$123,000 to archivists Bruce Bruemmer of CBI, Mark Lloyd of the University of Pennsylvania Archives, and Michael Nash of the Hagley Library to microfilm the trial exhibits of *Honeywell vs. Sperry Rand*, otherwise known as the ENIAC Trial. The three institutions will collaborate to preserve and make accessible one of the most valuable research collections in the history of computing.

Honeywell disputed the Univac claim of patent rights to the electronic digital computer, and its lawyers ultimately demonstrated that work on the ENIAC was in part derived from John Vincent Atanasoff.

Early documents on the development of the electronic computer were collected by attorneys on both sides, and eventually found their way to the three institutions. They have been used extensively, leading to recent books on the ENIAC and the Atanasoff-Berry Computer.

Microfilm was chosen to preserve the collection after electronic scanning and storage were deemed not mature enough for use. Image scanning from microfilm remains a future possibility for the collection.

The project will begin this summer and take two years to complete. Most of the

preparations for microfilming will occur at the University of Pennsylvania, since they have the largest collection. □

Recent Publications...

Continued from page 4

The Evolution of the Computer from Mainframes to Microprocessors, (New York: Norton, 1996).

Spencer, Donald D., *Key Dates in Computing and Mathematics History*, (Ormond Beach, Florida: Camelot Publishing Co., 1995).

Swade, Doron, "Collecting Software: Preserving Information in an Object-Centered Culture," in *Electronic Information Resources and Historians: European Perspectives*, (St. Katharinen: Scripta Mercaturae, 1993): 93-103.

Usselman, Steven W., "Fostering a Capacity for Compromise: Business, Government, and the Stages of Innovation in American Computing," *IEEE Annals of the History of Computing* 18:2 (1996): 30-39.

Van den Ende, Jan, "Computers and Industrial Organization: Early Sources of 'Just in Time' Production in the Dutch Steel Industry," in *IEEE Annals of the History of Computing* 17:2 (Summer 1995): 22-32.

Veit, Stan, *Stan Veit's History of the Personal Computer*, (Asheville, NC: WorldComm, 1993).

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Minnesota Proclaims "Year of the Computer"

Minnesota Governor Arne Carlson declared 1996 the "Year of the Computer" at the 50th Anniversary Luncheon held on May 22 in Minneapolis, during the annual "Strictly Business" computer show. CBF Trustee William Norris accepted the proclamation on behalf of the Minnesota computer industry.

Norris recalled the early history of Engineering Research Associates, and the development of computer-based educational tools, starting with the Control Data Corporation's PLATO system. He stated that Minnesota's strong educational software industry is due to efforts by companies like CDC.

A panel session on "Future Technology and its Impact on Society," moderated by Tom Kieffer, chair of the Minnesota Software Association, with Ann Winblad, cofounder of Hummer Winblad Venture Partners, Jay Novak, Commissioner of the Minnesota Dept. of Trade and Economic Development, Gary Smaby, founder of Smaby Group, and Nils Hasselmo, President of the University of Minnesota agreed that the Internet provides numerous opportunities for business, education, and government.



The Cray-1 and CDC 1604 on display at the Strictly Business Computer Expo, where the "Year of the Computer" was proclaimed.

Winblad believed that the Internet has been under-hyped.

The luncheon was sponsored by the Minnesota Software Association, in cooperation with CBI, the Minnesota Dept. of Trade and Economic Development, the Minnesota High Technology Council, DPMA, and the Association for Women in Computing. It was held in conjunction with the Strictly Business Computer and Graphics Expo.

CBI set up a temporary computer

museum including a Cray-1 loaned by Cray Research (a subsidiary of Silicon Graphics), and a CDC 1604 loaned by The Computer Museum.

Upstairs, CBI photographs were on display in the History of Computing Theater, along with an historical narrative of computing in Minnesota. The theater was the site of three panel sessions on the history, present status, and future of computing. Local sponsors included UNISYS and Skyline Displays, Inc.



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