

CHARLES BABBAGE INSTITUTE NEWSLETTER

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CENTER FOR THE HISTORY OF INFORMATION PROCESSING

Minnesota Year of the Computer

Engineering Research Associates (ERA), formed in January, 1946, was one of the first companies to produce an electronic computer. ERA inaugurated fifty years of astonishing activity in the field of information processing in Minnesota, just as the public announcement of the ENIAC a month later began a similar development in Pennsylvania. In 1951 and 1952, the offshoots of these two activities, ERA and the Eckert-Mauchly Computer Corporation were acquired by Remington Rand, and became its Univac Division in 1956.

CBI, in cooperation with the Hubert H. Humphrey Institute, is planning a conference on computers, competitiveness, and quality at the University of Minnesota and a public celebration of 50 years of Minnesota computing for September 1996. Similar activities are planned in Pennsylvania in connection with the 50th anniversary of the ENIAC.

CBI Archivist Bruce Bruemmer has constructed a special World Wide Web page on the Minnesota celebration. The Web site will form the basis for a stand-alone exhibit intended for display at institutions, like the Walker Art Center and at the Mall of America. In addition, Bruce is planning a virtual museum and a speakers series with the Minnesota Historical Society, the Science Museum of Minnesota, and the Minnesota Software Association.

A special committee on the Year of the Computer has been formed which includes representatives of MSA, CBI, ACM, the Minnesota State Department of Trade and Economic Development, the Minnesota High Technology Council, and



Earl Joseph programs the ERA 1101 Computer, the first commercial computer placed on the market by ERA, Inc., which was founded 50 years ago next January.

other industrial and public organizations.

CBI is also participating in the national "Year of the Computer." CBI Director Bob Seidel is editing a special issue of the *Annals of the History of Computing* presenting an overview of 50 years of computing including articles by William Aspray and Emerson Pugh, James Cortada, J.A.N. Lee and Michael Mahoney, Arthur Norberg, and Steven Usselman. It is scheduled to appear in January 1996.

Arthur Norberg is completing his study, "Computers and Commerce, a History of the Early Computer Industry in Minnesota," to be published in 1996. An oral history project is underway which will supplement the Norberg study by tracing the subsequent development of

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Foundation Plans

Fundraising Campaign

The year of the computer calls for action to preserve and interpret the history of information processing. An ever-increasing amount of paper, electronic, and company records is becoming available, as are new oral histories and other material of historical importance. The executive committee of the Charles Babbage Foundation is planning a fund-raising campaign in order to expand CBI's activities (see *Newsletter*, vol. 16, no. 4) and to take maximum advantage of planned new facilities in the new University of Minnesota Archives Center to be built in 1996-1998.

CBI needs additional staff and equipment that will enable us to handle the increasing number of individual and company records, oral histories, and other documents donated to our collections, as well as to house expanded research activity. We also plan to inaugurate an Information Sciences Hall of Fame in the new facility.

CBI/CBF Director Robert Seidel, CBF Executive Committee Members Walter Bauer and Walter Carlson, President Willis K. Drake and Chairman Erwin Tomash are spearheading this effort, which will be implemented in 1995-96, in cooperation with the University of Minnesota and the Institute of Technology Advancement Office.

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CBI Archives — Not Just for Scholars

CBI's archives is one of the few places in the world for scholars to find unique records on the history of computing. But academic scholars are not the sole source of research requests handled by the archives staff. Each day requests come to CBI through correspondence, electronic mail, and phone calls relating to all aspects of computing and information processing. Journalists, intellectual property attorneys, publishers, and hobbyists all have found CBI's archival collections a rich source of information. Occasionally, callers misunderstand CBI's mission to support the history of information processing. Some inquiries assume that CBI is a policy institute; others have tried to order spare parts for equipment manufactured by Burroughs and Control Data (CBI has the records of those two companies, but no spare parts). The staff never knows what to expect from inquiries, but we try to help in all cases. Here's a sample of

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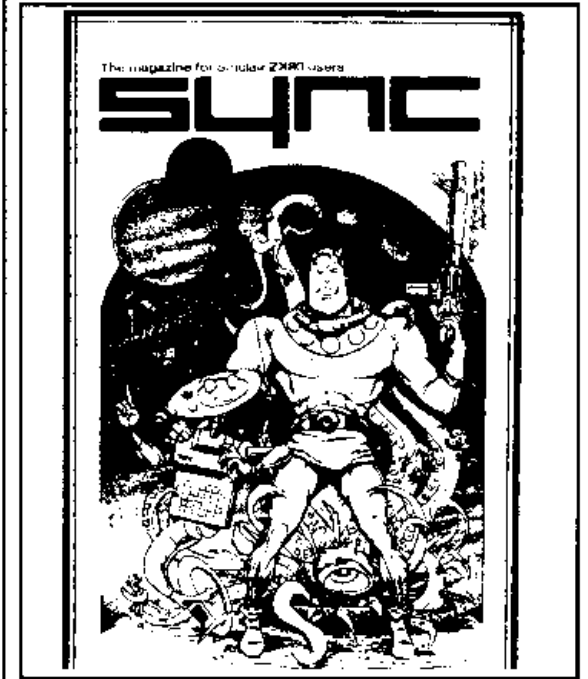
some recent requests:

- ◆ a consultant investigating an old Navy site needed information about a computer that was located there in 1950 (CBI supplied the information).
- ◆ a former Burroughs salesman inquired whether we could identify the jeweler who made his Burroughs Legion of Honor pin (staff found information about the pin, but the name of the jeweler was not located).
- ◆ an editor of a software magazine needed an explanation of the Turing test (CBI provided it).
- ◆ a department of Control Data Systems wanted a list of contracts awarded in excess of 10 million dollars to Control Data Corporation over the past twenty years (CBI compiled the list from its collection of CDC press releases).
- ◆ a CD-ROM publisher needed a photo of a computer from the 1950s (CBI provided).
- ◆ an intellectual property attorney wanted all available documentation on a specific computer from the 1960s (the requested material was dispatched in 24,000 photocopies).
- ◆ a retiree wanted to know when the Burroughs adding machine in his garage was manufactured (CBI has a list of serial numbers and dates of manufacture).
- ◆ a health professional, mistaking Burroughs Corporation for Burroughs Wellcome, requested a material data sheet on a specific drug (staff described the difference between the two companies).
- ◆ a business owner wanted manuals on a computer he purchased at auction (CBI provided them).

Some requests are based on personal interest (hobbyists, collectors, and former employees), and other requests have significant financial consequences (lawsuits and property appraisal). The CBI staff welcome such inquiries, even though they challenge our resources (or our sense of humor).



SYNC Editor donates Microcomputer literature



"Proclaim the computer of your choice on your chest with our own Crash Cursor and Sync," ran an advertisement for t-shirts in the first issue of SYNC: The Magazine for Sinclair ZX80 Users (1981). The magazine was part of a donation to CBI by Dr. Paul Grosjean.

Paul E. Grosjean, former managing editor of *Sync: the Magazine for Sinclair and TIMEX/Sinclair User*, donated a collection of books and periodicals on micro-computing, especially with Sinclair computers, to CBI in March. While most of the works have been cataloged separately in MNCAT (the University of Minnesota's on-line catalog), the publications on Sinclair and Timex Sinclair computers have been cataloged together as CBI 112 with searches possible on individual titles.



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Conference features Software, Venture Capital CBI Archivist Elected to SAA Council

Fort Lauderdale was the site of the 41st Annual Meeting of Business History Conference, March 17-19, 1995. Business and computer historians were well represented. So was CBI. Bob Seidel commented on three papers relating to the development of the software industry in the session "Beyond Hardware: Aspects of the Computer Industry."

Peter Coopey examined British venture capital investment in the 1970s and 1980s and compared it with the US venture capital industry in his paper "Venture Capital and the Computer Industry: Financing Growth Companies in the UK." Coopey argued that British venture capital "reflected a move towards what were judged to be less risky areas of investment," than high technology firms such as those in the computer industry by following a short-term, low-risk, large-scale investment strategy which did not favor computer-sector companies. He is coauthor of *Fifty Years Investing in Industry* (Oxford University Press, 1995), a history of Britain's leading investment capital company 3i, and used it as a model.

Coopey focused on a factor in the development of the computer industry which requires further attention. The sources of capital for the development of high technology range from the Department of Defense to individual profits won in larger firms like Hewlett-Packard, DEC, and CDC which spawned dozens of spin-offs, and also invested in start-ups. We need to know more about the venture capitalists who fostered these firms.

Martin Campbell-Kelly's paper, "Development and Structure of the International Software Industry, 1950-1990," divided the industry into software contractors, packaged software manufacturers, and personal computer software developers. These types of firms emerged sequentially in the history of the industry. Campbell-Kelly explained American dominance in the software industry in terms of federal government support and market size. He attributed IBM's difficulties with personal computer software in terms of the weakness of its human-

factor research. ARPA-sponsored research on the human-computer interaction that diffused into Xerox, Hewlett-Packard, Apple, and Microsoft, he argued, was the source of their strength in the software industry. These are valuable insights, and suggest the continuing importance of Department of Defense investment in the computing industry.

Jo Anne Yates' case study focused on packaged software for the insurance industry. "Application Software for Insurance in the 1960s and Early 1970s" tells how the market for packaged-insurance software in the 1960s arose out of outrageous programming costs incurred by the industry in adopting computers.

Although these costs were to some extent mitigated by the development of new programming languages like COBOL and increased support from vendors of computers in the form of operating systems and generic programs, there was still demand for application-specific software. This was supplied at first by computer manufacturers, whose packaged software succeeded in fulfilling the demands of smaller companies, but larger firms continued to program their own software, just as mainframe users in the sciences and engineering had done. Third-party programs were also developed by industry collaborations and by Ross Perot's Electronic Data Systems Corporation (EDS), which provided customized software, as well as by new software-firms like Computer Usage Corporation and Informatics.

As it did for the packaged software industry in general, IBM's unbundling of software from hardware gave impetus to the independent insurance software industry. Software and service companies were the first to respond, some with joint ventures with the industry. Many firms provided support systems in competition with IBM, which had, in separating the cost of hardware and software, made the cost of the latter visible, thus insuring application packages.

In addition to these papers, Pierre Mounier-Kuhn, visiting scholar at CBI in 1994, presented a paper, "French

Business History continued on page 4...

The Society of American Archivists, the largest professional organization of archivists in the world, has elected Bruce Bruemmer, CBI's archivist, to its council. Bruce will serve a 3-year term on the nine-member council, which is responsible for the Society's programs and policies. When he officially joins council this summer, he will step down as chair of Society's Public Information Committee, a body dedicated to advocacy of archives in the United States and Canada.



Bruce Bruemmer

Over the next three years the Society and the archival profession will face issues that involve the health and future of the archives in our society. Electronic records, the continued politicizing of the office of the Archivist of the United States, assaults on the budgets of the National Historical Publications and Records Commission, the National Science Foundation and the National Endowment for the Humanities, and diminishing financial resources for individual repositories are among issues of current and future interest to the Society. Bruce looks forward to working with colleagues on these issues of national importance and of particular importance to the history of information processing.



Recent Publications

Aspray, William, "Edwin L. Herder and analog computing in the electric power industry," in Ferderik Nebeker, *Sparks of genius: Portraits of electrical engineering excellence*, (New York: IEEE, 1994)

"Blasts from the past: Highlights from two decades of covering the PC revolution," *BYTE* (June, 1995) 41.

Arn Borst, *The ordering of time: From the ancient computus to the modern computer* trans. from the German by Andrew Winnard (Chicago: University of Chicago Press, 1993).

J. M. Bennett, Rosemary Broomham, P. M. Murton, T. Peracey, and R. W. Rutledge, eds. *Computing in Australia the development of a profession* (Sydney: Hale & Iremonger, 1994).

Colin Burke, *Information and secrecy: Vannevar Bush, Ultra, and the other Memex* (Metuchen, N.J.: Scarecrow Press, 1994).

"Computers and museums: Problems and opportunities of display and interpretation," in Howard P. Segal, *Future imperfect: the mixed blessing of technology in America* (Amherst: University of Massachusetts Press, 1994).

Richard Coopey and Donald Clark, *3i: Fifty years of investing in industry* (New York: Oxford University Press, 1995).

Glenn E. Dawson, *The digital revolution*. (Limited ed. Downers Grove, Ill. : GMN Corp., 1994).

Paul N. Edwards, "Hypertext and hypertension: Post-structuralist critical theory, social studies of science and software," *Social Studies of Science* 24 (1994), 229-278.

Jennifer Flynn, *20th century computers and how they worked: the official Starfleet history of computers* (Carmel, Ind. : Alpha Books, 1993).

Chris Hables Gray, "The culture of war cyborgs: Technoscience, gender, and postmodern war," *Research in Phil. Technol.* 13 (1993), 141-163.

Jonathan Grudin, "Computer-supported cooperative work: history and focus," *Communications of the ACM* 36 (Sept. 1993) pp. 27ff.

CBI Plans

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the computer industry in Minnesota.

Charles Babbage Foundation Trustee Thomas Hughes is serving on the Historical Advisory Committee to the ENIAC celebration at the University of Pennsylvania, and his graduate student, Atsushi Akera, the 1995-1996 Tomash Fellow (currently visiting CBI), has participated in planning of both the Philadelphia and Minnesota events.

Seidel and Bruemmer also serve on the ACM committee planning the 50th anniversary conference of the ACM and a banquet honoring pioneers of the computer industry. The banquet is planned to coincide with the celebration of the ENIAC's 50th birthday on February 14, 1996.

Those who are interested in these activities should contact CBI for further information.



History of mathematical programming: A collection of personal reminiscences. ed. by Jan Karel Lensta, et al. (Amsterdam: CWI, North Holland, 1991).

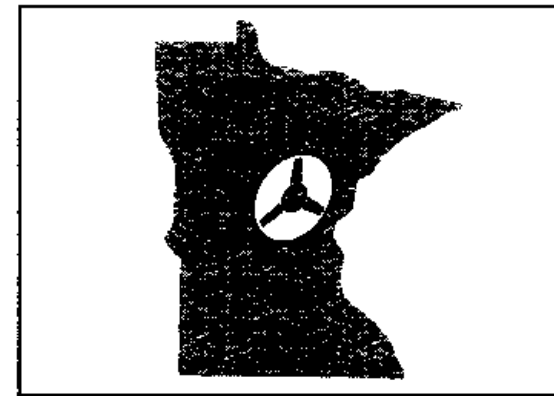
Loet Leydesdorff, *The Challenge of Scientometrics: the development, measurement, and self-organization of scientific communications* (Leiden: DSWO Press, Leiden University, 1995).

Ian Locke, *The microchip and how it changed the world* (New York : Facts on File, 1995).

Morris, P. R., *A history of the world semiconductor industry* (IEE History of technology series, 12.) (London: Perginon on behalf of the Institution of electrical engineering, 1990).

Dennis Elliott Shasha and Cathy Lazere, *Out of their minds: the creators of computer science* (New York: Copernicus, 1995).

Donald D. Spencer, *The timetable of computers : a chronology of the most important people and events in the history of computers* (Ormond Beach, Fla.: Camelot Pub., 1995).



Minnesota Computing 50th Anniversary Logo designed by Bruce Bruemmer

CDC Interviews Available

A number of interviews in the Control Data Corporation records (CBI 80), have been cataloged separately to provide better access to this excellent source of information on the company. William C. Norris, Robert Price, Robert L. Perkins, and other CDC notables are included in the collection, which was produced by the company in the 1980s. Abstracts, available on MNCAT (the University of Minnesota's on-line catalog), include more detailed information.

Changes in national cataloging practices eliminated "851-qualified" keyword searches of CBI's records. MNCAT (pubinfo.ais.umn.edu) can now be searched using an "852" qualifier. For example, k=control data.su. and babbage.852. will retrieve CBI records with Control Data Corporation as a subject. It is essential to type all periods in the command. The rest of the collection is being processed as time and resources permit. □

Business History

continued from page 3.

Computer Manufacturers and their U. S. Partners, 1950-1970" in the session on Multinational Investments, and Daniel Holbrook presented "Government Support of Semiconductor Technology: Diverse Approaches and Information Flows" in the session on "The Cold War and American Economic Development."



Herbert Simon Lectures at University of Minnesota

Charles Babbage Foundation Trustee and Nobel Laureate Herbert Simon lectured on "Altruism: The Root of Racial and Ethnic Loyalty," at the University of Minnesota on Friday, May 19. Professor Simon, who teaches at Carnegie Mellon University, received the Nobel Prize in Economics in 1978 for his work in Economic Sciences.

During his visit, Professor Simon visited the Charles Babbage Institute and spoke with Director Bob Seidel and former director Arthur Norberg. Among the topics of discussion were Norberg and O'Neill's forthcoming history of the Information Processing Techniques Program Office of the Advanced Research Projects Agency, to which Simon contributed.

Professor Simon also visited the CBI Archives, where he discussed techniques for handling electronic files with archivist Bruce Bruemmer. Current work that he and his colleagues are doing in artificial intelligence may be applicable to the solution of problems arising processing electronic records, Simon pointed out.

Simon recently wrote about his work in information processing:

"Human beings use symbolic processes to solve problems, reason, speak and write, learn and invent. Over the past thirty years, cognitive psychology has built and tested empirical models of these processes as they are used to perform simple tasks. The models take the form of computer programs that simulate human behavior."

"My colleagues and I are seeking to extend the range of such explanations of human thinking to new phenomena and domains. Our research is focused on the phenomena of (1) learning from examples, (2) finding good problem representations, (3) extending EPAM, a



Herbert Simon visits the Great Wall of China during one of his many visits to introduce a secondary school mathematics curriculum

unified theory (simulation) of human perception and memory and (4) making scientific discoveries."

"We have built computer programs that can learn new skills by examining 'worked-out' examples of solved problems. Using these programs as models, we have designed an entire secondary school mathematics curriculum (algebra and geometry) that is now being used in Chinese schools."

"By experimenting on the relation between problem difficulty and the way a problem is formulated, we are trying to understand how problem solvers can discover and use new and more effective problem representations. Our experiments and computer models are also aimed at discovering why visual diagrams often provide powerfully effective problem representations."

"The EPAM program is now capable of explaining behavior in a score of experimental paradigms, including the phenomena of expert memory. A public version of EPAM has been prepared for dissemination to other cognitive psychologists."

"In research on scientific discovery, our computer programs are capable of making actual discoveries that model important cases from the history of

science. We are conducting laboratory experiments that place subjects in discovery situations."

"All of the research of our group involves comparing the results of computer simulation of behavior with laboratory experiments that use human subjects to perform the same tasks."

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More CBI Friends

The Charles Babbage Institute gratefully acknowledges the individuals and organizations listed below for their recent renewals or new membership in the 1995 Friends of CBI program. Information about the Friends Program can be found in the Fall Newsletter or by contacting CBI.

Colleague Members:

Tibor Fabian

Robert M. Price

Associate Members:

James J. Bohning

Earl E. Swartzlander

(These are additions since our last newsletter).

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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.

SHARE Marks 40th Anniversary

In 1955, a number of IBM 701 users preparing to adopt the new IBM 704 were concerned over the expense of rewriting program libraries. They formed SHARE, a group to share programs and develop a new compiler.

From a modest beginning of 17 installations and 46 participants, SHARE has become an international organization of users of complex IBM systems. SHARE has a full-time staff and over 1,800 member installations, including leading U.S. and international corporations, representative government agencies and world class educational institutions.

CBI holds early SHARE records (CBI 21), including general correspondence, membership information, meeting agendas, SHARE distribution correspondence, published meeting proceedings, and a SHARE operating system manual. The general correspondence is limited to 1955-1958.

Other collections at CBI relating to SHARE are: the Francis V. Wagner Pa-



The 737 magnetic core storage unit of an IBM 704 installation at General Electric in Evendale, Ohio. GE was one of the early members of SHARE, which was formed to develop software for the IBM 704 (ca. 1956) from the CBI photographic archives.

pers (CBI 6), Herbert S. Bright Papers (CBI 42), Joan M. Winters Papers (CBI 22), and oral histories of Paul Armer (OH 59) and R. Blair Smith (OH 34).

Inventories of these collections are

available on the CBI Gopher (gopher://cutter.lib.umn.edu:70/11/subject-list/archives-spec/babbage-dewey/collection-aids) or by contacting the CBI staff.



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