CHARLES BABBAGE INSTITUTE

CENTER FOR THE HISTORY OF INFORMATION TECHNOLOGY

NEWSLETTER
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Summer 2003

In This Issue:

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CBI Annual Report

July 1, 2002 to June 30, 2003

Our report this year is divided into two parts. Part One contains a discussion of historical research and archival research and development, as well as some recent efforts undertaken at CBI as part of our continuing outreach activities to make people aware of the usefulness of the CBI collections. Part Two presents a series of reports on the accomplishments achieved day-to-day in our continuing efforts to fulfill CBI's mission.

Part One: Research

Introduction

Research has been a fundamental component of CBI's mission since the founding of the Institute a quarter century ago. Research at CBI is critical to advancing scholarship and knowledge in many areas of the history of information technology and also is an activity that works synergistically with CBI's other fundamental mission of maintaining and extending its world-class collection of archival materials. CBI research is done as group projects, such as the present Software History Project and the earlier DARPA/IPTO study, and as individual research projects of staff members. During the year, we completed a number of essays and articles for publication, bringing earlier research projects to completion. This research has been sent off to publications in the history and archives fields and we expect it will appear in print in Fiscal Year 2004. Last fall, Jeffrey Yost's *A Bibliographic Guide to Resources in Scientific Computing, 1945-1975* (Westport, CT: Greenwood Press, 2002) appeared. To open our discussion of research, we note that this year was the final full year for the Software History Project, and a number of products of that project came to fruition and were mounted on the CBI Web site for general use.

Software History Project

In FY 2002-3 CBI's Software History Project investigators worked to complete and enhance several online products of the grant. In September 2002, as part of the NSF-sponsored Software History Project, "Building a Future for Software History" (NSF 9979981), CBI launched *Iterations: An Interdisciplinary Journal of Software History* with Volume 1. (http://www.cbi.umn.edu/iterations/index.html). Jeffrey Yost serves as the editor of the journal and Philip Frana is the associate editor. This peer-reviewed scholarly journal contains articles on software development and applications from long-time leaders in information technology history, including James W. Cortada and Paul Ceruzzi, as well as exciting work from more recent entrants into this field, such as Julian Kilker. The journal also contains reviews of individual resources in software history available on the World Wide Web. Immediately, work began on Volume 2, parts of

which were mounted on the Web site this past spring and review continues on other manuscript submissions. We expect a complete Volume 2 by late 2003.

In May, the online Software History Dictionary project site became available to scholars and others on CBI's Web site (http://www.cbi.umn.edu/shp/entries/dictionaryindex.html). Dictionary entries will continue to be added and augmented as part of CBI's ongoing software history activities. A year ago, we reported that work on the dictionary, following the original plan of using outside authors, was proceeding too slowly to produce a useful reference tool by the end of the project. A new model was established last year and most of the dictionary entries are being written by CBI project staff. Volunteers from the software community continue to assist with the important task of authoritatively reviewing the entries. CBI historians and research assistants focused on important areas that have been neglected in the past, namely, databases, graphics, scientific applications, and business applications. Through extensive research, a smaller, but growing and ultimately very useful, online reference tool is being created.

Over the course of the project, 26 oral histories with pioneers in software development and the software industry have been conducted. The interviews provide information and perspective on the origin and early research, development, and management in the software industry and academe. Most interviews have been transcribed and edited, and are now available on the CBI web site at http://www.cbi.umn.edu/oh/. Individuals interviewed in the past year include:

Richard Canning
Stephen Cook
C. A. R. Hoare
Harry Markowitz
Donn Parker
Peter Watson

Several more interviews will be conducted in the coming fiscal year to bring the total to the expected 32 people.

Project Principal Investigators and the Project Manager will next turn their attention to the writing of a final report of activities taking place under the grant. This report will explore the role, function, and responsibilities of online communication and resource building to the advancement of historical research and also serve to guide present and future work on the history of software.

Research Projects of Individuals

Among the several essays under consideration or accepted for publication are: a discussion of the early history of medical information systems and privacy to appear in a forthcoming volume of the American Society for Information Science and a book chapter on computers and the Internet, for an undergraduate reader from Blackwell Publishers, both by Jeffrey Yost; an essay by Arthur Norberg on the development of astronomical

calculating techniques of the 18th and 19th centuries in a volume from Oxford University Press (in press); and a book chapter by Philip Frana on assessing risk in biomedical research and health policy in a forthcoming volume from Rutgers University Press. Publications that appeared in print this year can be found in the appropriate section of Part Two. The following brief summaries offer a flavor of the new or continuing activities of individual research projects of the past year.

Norberg: While he worked to bring his study of the early engineering computer companies—ERA, EMCC, and Remington Rand—to conclusion, Arthur Norberg focused his research on the little explored software developments in these companies. Beginning in early 1947, John Mauchly assumed responsibility for programming, coding, and applications for the planned EMCC computer systems. Over the next decade, EMCC (both as a company and division of Remington Rand) assembled a group of programmers and maintenance engineers who developed many new programs and procedures for use with Univac. The group determinedly tried to convince the community to use these techniques, helping to change the way business was conducted.

Yost: Following a broad research agenda, Jeffrey Yost is currently engaged in a number of research projects on the business, social, and cultural history of information technology. He is currently preparing a book for Greenwood Press that surveys the business history of the computer and software industries. This work focuses on strategic management within firms with particular emphasis on the demand/consumption side of computing, software, networking, and services. He recently wrote a book chapter for a new social and cultural studies anthology in the history of American technology about the history of computers and the Internet, and the societal impacts of these technologies.

Yost also made a substantial start on a project to investigate the history of privacy and security. The opening gambit of this important project was an essay on the issue of privacy and medial informatics, from its origin in the 1960s to the present. Yost's essay analyzed public opinion and trust of medical care providers and institutions, and the background and work of the advocates and critics of medical computing, all within the broader legal, philosophical, and cultural contexts of the escalating national issue of data banks and privacy.

Kaplan: Through analysis of archival writings between the 1940s and 1970s, Elisabeth Kaplan is analyzing the role of computer technology in shaping the fundamental character and direction of the American archival profession during this period. She suggests that archivists' complex relationship with technology is inextricably tied to archivists' attempts to distinguish themselves professionally from librarians and historians, the two disciplines from which the profession emerged in the early part of the twentieth century.

In a second study, Kaplan launched an intensive project to address the problem of selection, indexing, and preservation of historically important born-digital records for CBI's collections and submitted a grant proposal. If funded, CBI, the University Libraries, Internet 2, and the graduate School of Information at the University of

Michigan will collaborate on the project. This research has potentially enormous significance for CBI, as we hope to gain knowledge about appraisal and collecting of born-digital records important to the documentation of the information technology activity. These are records that do not exist in any other form and we need to collect them and make them accessible in their original format. While this project is going on, normal collection activities will continue undiminished.

Frana: Studying the application and impact of automated critiquing systems in medicine, Philip Frana began a major research project on the history of medical informatics. Among other insights, this project identifies how the critiquing approach in part relieved the computing machine systems used in various diagnostic routines of responsibility for faulty medical planning because it required the continuing careful attention of human operators. Frana recently completed a study of the history of Internet Gopher, which will be published as an article next year. Much of Frana's time was devoted to the Software History Project, and the results of that effort are now available on the CBI Web site.

Evaluations and Reflections as part of Outreach

For a quarter of a century, the Charles Babbage Institute has been assiduously collecting records, manuscripts, photographs, videotapes, product literature, and ephemera, as well as tape-recorded oral history interviews (conducted by CBI historians) with principals in the area of information technology to preserve them as a basis for research and writing about the activity. Activity here refers to all those areas involved in developing and using information technology, from the academy, industry, government, and the public. It is an inclusive definition rather than an exclusive one. In short, CBI attempts to document all aspects of the activity. CBI and others explore these materials to tell this broad history for the use and enjoyment of present and future individuals interested in the emergence, growth, and change of the handling of information by society. An understanding of the range of this substantial collection can be obtained from the CBI Web site and the various brochures describing CBI and its collections. Even in so short a time, this material has become a grand legacy revealing the past of this influential activity.

Over the 25 years of CBI's history, we have repeatedly evaluated the kind of research use to which the CBI Archives have been put and the type of questions posed to us by researchers and writers. These analyses led to adjustments in both collecting to accommodate new questions and to syntheses providing automated answers to repeat questions, such as those about Charles Babbage and those about calculating and computing machines of the past. Good archives do this all the time; collecting never ends in the documenting of a rapidly evolving area like information technology.

We also noticed another change, one to be expected: a new generation of users entered the field over the last decade. While some of their questions are similar to those of historians active in the history of information processing since the early 1980s, much of their focus is different. Their questions tend to be broader in concept, more culturally and institutionally focused, and reveal less familiarity with the depth of CBI's collections and how researchers can use the collections to answer their questions. Thus, as part of

our outreach program, over the past year we wrote a series of "white papers" for the *Newsletter* illustrating CBI's procedures for generating resource materials. We also referred to how these materials were used to examine both new and traditional questions in the history of information technology.

Simultaneously, since these questions are focusing on more recent events and developments, we needed to evaluate what new records should be sought to assist with research and to document these more recent activities in information technology. Our evaluation went well beyond the traditional search for documents about hardware, software, applications, and contexts for innovation, such as companies. We examined the new trends in computer science and information technology, new formats for documents that are outside the more traditional records, and previously peripheral areas that have now moved to center stage, such as privacy and security. We accomplished this study while we attended to our regular activities of collecting and processing collections, conducting oral histories, and pursuing research in history and archival theory. Some of our findings became part of the research projects described in the preceding section, such as the work on security and privacy and the investigation of software in the Eckert-Mauchly Computer Company. Other findings will motivate collecting emphases in the future. The overall collecting policy remains intact, but our eyes are more keenly cast on these emphases to ensure the possibility of collecting the most historically important materials.

We also noted some other trends. For example, present attention by various organizations to the history of software converged with the interests of CBI. CBI's NSF-sponsored Software History Project is only the latest in a series of CBI activities devoted to the history of software. Believing it to be important to highlight the links between this project and earlier activities, CBI prepared several articles and reports detailing past and present endeavors. Given CBI's overarching mission, these articles and reports placed the software activities in the larger context of CBI's research program and archival development and their accomplishments over the last two decades. Attention to these issues actually began in the previous fiscal year with the publication of "Use of CBI's Oral Histories" in the Spring 2002 CBI *Newsletter*. There we characterized the various types of oral history techniques, and called attention to CBI's focus on research-grade oral histories. Because there is a trend in both professional and funding circles to emphasize less intensive procedures in oral history and to record more data and information stimulated almost solely by the interviewee, we believed it important to illustrate the value of our nearly 350 oral histories to research, writing, and collecting and the procedures by which they were produced. CBI uses a project-centered selection process for choosing potential candidates for oral histories. We believe this procedure results in oral histories that go well beyond the anecdotal and non-contextual data obtained from non-structured procedures. This *Newsletter* article detailed the results of several projects, and noted the use to which the oral histories have been put by a new generation of users who were uninvolved in the projects for which these oral histories were recorded.

CBI participated in a May 2003 CBF-sponsored "Strategic Planning Meeting" focused on what could be done to preserve and promote the study of the history of software and services. The meeting, which included 14 organizations, broadened its agenda to investigate how these groups could work together on a range of historical concerns. In a prepared statement circulated at the meeting, CBI described the many ways its collecting and research activities have resulted in resources for the history of software, including appraisal aids for use in evaluating materials for preservation. (The still-relevant book *The High Technology Company: A Historical Research and Archival Guide* (1989) produced by CBI describes the nature of a high-technology company's records and how to appraise them.) We pointed to the link between research and effective collecting, with examples from several research projects conducted at CBI. Attached to this statement was a report on "Software History Bibliography of Staff Publications, Sponsored Dissertation Research, Institute Publications, Oral Histories, and Archival Collections." Similar reports on other areas of CBI endeavors in research and collecting are planned over the next few years.

A second *Newsletter* discussion focused on current research, concentrating on the description of projects found above, but also showed the roots of current projects in past research efforts at CBI. Though in this *Newsletter* article we made no attempt to tie these research projects to specific collections within CBI, we could easily do so. We did make substantial connections among several of these projects with the oral history collection in the earlier article on CBI oral histories.

Our third major piece was an article on "The International History of Information Technology at CBI" in the Winter/Spring 2003 *Newsletter*. Internal and external research and collection development at CBI has long concentrated on fundamental developments, use, and social impacts of computing, software, and networking in the United States. Alongside these efforts, CBI has also shown a continuing commitment to advance knowledge and resources on the international history of information technology, the subject of this article. We highlighted three areas of CBI activity: collections at CBI, including oral histories; publications and resources produced by CBI; and the research efforts and products of Tomash Fellows and scholars in residence.

One other study during the year for which a report has not yet been prepared examined the feasibility of someone's investigating the history of the software industry that offers a different focus than the recent important book by Martin Campbell-Kelly. We have in mind a study concentrating on the structure of the industry at various times, the companies that made up that structure, and the personalities that drove the industry, both technical people and entrepreneurs. We examined the CBI collection, the trade literature, and oral histories to determine the extent of available resources. We came to the conclusion that it is premature to undertake writing such a history because it would be limited to the use of oral histories, and an insufficient number of them at that. As those associated with archival development know well, the desire for collections in no way leads to the acquisition of any collections. Archival development is a long and somewhat random process, both in the uncovering of historically significant materials and in the acquisition of them. Once contact has been made with a potential donor, the rest depends

on the motivations and interests of the donor for whether materials are donated. We will endeavor to seek out new collections in this area of the software industry wherever we can find them, and, if received, make them available as soon as feasible in order to facilitate further work on the history of the software industry.

These examples represent highlights of the past year devoted to our continuing outreach and development efforts. We prepared these articles and reports while we pursued the day-to-day activities of CBI. In Part Two of this year's report, we describe the regular activities of CBI, including collecting; processing; research, presentation, and publishing; service to patrons; and continuing efforts to add information and increased functionality to the CBI Web site.

Part Two: Collections, CBI Web Site, Service, Publications and Presentations, Support, and Staff

1. Collections

Work continues apace on collecting and processing. Among the collections acquired this year were:

John Diebold, Inc., Records
Herbert Ohlman Papers
Walter Anderson/General Kinetics Papers
ITAA Records
RedSiren Computer Security Records
Seattle Computing Records
ADAPSO Records
Milton Wessel Records (additions)

We will process these collections as soon as possible.

During the past year, we completed processing for a number of collections. Among these collections were:

Robert Head Papers
Blake Archive Project Records
Milton Wessel Papers
Minnesota Joint Computing Records
Alex McKenzie Papers
General Electric/H. R. Oldfield Papers

Information on and finding aids for these collections can be found on the CBI Web Site (http://www. cbi.umn.edu/).

Encoded Archival Description

In spring 2003, University of Minnesota University Librarian Wendy Lougee appointed a five-member task force charged with preparing recommendations for Libraries-wide implementation of Encoded Archival Description. EAD is the XML-based international data structure standard for designating the content of archival finding aids and enables Internet delivery of the finding aids while ensuring their permanence by providing a stable, non-proprietary data storage environment from which data can be transferred to other software environments as necessary. CBI's Carrie Seib is a key member of the Task Force, and participated in a presentation in February to Libraries staff and administrators on the nature of the problem and the accomplishments of CBI in applying this technique to CBI finding aids. The Task Force's work will provide the technological infrastructure and support that will continue to enhance display and searching of finding aids of CBI and other archival units on the University of Minnesota campus.

Meanwhile, work on CBI's finding aids continues. This year all of CBI's finding aids were upgraded to EAD2002, which contains the latest upgrading of coding standards making CBI's digital aids consistent with the latest international standards.

2. Enhancements to the Web Site

New Web Site features

This spring, archives staff added two new features to enhance use of the web site. "QUICK LINKS," on the Home Page, allows users to link directly to some of the most frequently used resources, such as the CBI *Newsletter*, finding aids to the collections, the oral history database, and the Burroughs photo database. Another new feature allows people to subscribe to the online CBI *Newsletter* by contacting the Institute.

New Web Tools Implemented

Carrie Seib worked with Libraries Information Technology staff to implement cascading style sheets and server side includes (SSIs). These tools help to streamline Web site maintenance by automating repetitive page elements (such as headers, footer, and navigation features). Another benefit of SSIs is that they allow faster loading of Web pages, which is always appreciated by users.

We would like to acknowledge this assistance from the Libraries Information Technology staff of the University of Minnesota Libraries. The CBI Web site is more technically sophisticated and more helpful to users because of their help.

Citations Received

In July 2002, the Internet Scout Project selected the CBI Web site for inclusion in the July 5th issue of their National Science Digital Library Report for Math, Engineering, and

Technology, a current awareness publication offering high-quality information about valuable online resources.

Also in July 2002, the CBI Web site was selected as the "In Focus" feature on the UNESCO Archives Portal, a project of UNESCO's Information Society Division, which provides access to Web sites of archival institutions around the world and to resources on records and archives management.

3. Service

Statistics on Service

Patrons Served
During the year, CBI staff responded to enquiries from 327 individuals, representing a broad spectrum of the community from around the world. These responses resulted in 910 transactions, some involving a considerable amount of time. Using our Web site, visitors downloaded 2,272 oral histories, a record number for CBI in a single year. A random sampling revealed that many of these oral histories are being cited in major articles in journals such as *IEEE Annals of the History of Computing, Business History Review,* and *Technology and Culture* along with a number of books.

Service to the Archives and History Professional Communities

Elisabeth Kaplan

- Reviews Editor, *The American Archivist*, the archival community's premier journal
- Nominating Committee Member, Society of American Archivists
- Advisory Board Member, Smithsonian Institution, National Museum of American History, Lemelson Center for the Study of Invention and Innovation,
- Panelist, National Science Foundation's National Science, Technology, Engineering and Mathematics Digital Library Program (NSDL)

Jeffrey R. Yost

- Editor, *Iterations,* CBI's on-line journal devoted to the history of software and the software industry. Volume 1 appeared in October 2002.
- Committee Member, The Society of the History of Technology Leonardo da Vinci Medal Prize Committee for Lifetime Achievement in the History of Technology
- Chair of the Society of the History of Technology's IEEE Prize Committee for the best article on the history of electricity or electronics.

4. Publications and Presentations

Books

Jeffrey R. Yost, *A Bibliographic Guide to Resources in Scientific Computing, 1945-1975* (Westport, CT: Greenwood Press, 2002).

Articles

Juliet Burba and Philip L. Frana, "Researching the History of Software: Mining Internet Resources in the 'Old World,' 'New World,' and the 'Wild West,'" *Iterations: An Interdisciplinary Journal of Software History 1*(September 2002): 1-35.

Philip L. Frana, "Marion Dorset and Hog Cholera Research in the Biochemic Laboratory of the U.S.D.A. Bureau of Animal Industry," *Veterinary History*, Winter 2003.

_____, "Review essay: Medical Malpractice in the Midwest: The Strange Career of Quackery as Historical Problem," in *Annals of Iowa 62*(Summer 2003): 340-343.

Elisabeth Kaplan, "Many Paths to Partial Truths: Archives, Anthropology, and the Power of Representations," *Archival Science: International Journal of Recorded Information*, 2:4 (2003):

Carrie A. Seib and Elisabeth Kaplan, "CBI Oral History Interviews," "Digital Library News" (University of Minnesota Libraries) 3:1 (Spring 2003).

Presentations:

Philip L. Frana, "Reprogramming Human Disease: The Computer as Physician," American Anthropological Association Annual Meeting, New Orleans, LA, November 23, 2002.

_____, "Building the Robot Doctor: Computer Diagnosis and the Reconfiguration of Human Disease," Technotopias Conference, University of Strathclyde, Glasgow, Scotland, July 2002.

Elisabeth Kaplan, "Electronic Brains, Archival Minds: Computing and the Shaping of Professional Identity, 1945-1960," National Historical Publications and Records Commission Symposium, Boston, June 2003.

Carrie A. Seib, "Encoded Archival Description (EAD): What is it? What can it do? Where would we like to take it?" participated in a group presentation, Libraries Issues Seminar, University of Minnesota, Minneapolis, February 2003.

Jeffrey R. Yost, "Reprogramming the Hippocratic Oath: The Early History of Medical Informatics and Privacy." Second Conference on the History and Heritage of Scientific and Technological Information Systems, Chemical Heritage Foundation, Philadelphia, Pennsylvania, November 2002.

_____, "The Charles Babbage Institute," presentation at the Charles Baggage Foundation Annual Trustees Meeting, May 17, 2003.

5. Support for CBI

Primary Support
CBI is an organized research and archival unit of the University of Minnesota. As such, it receives the major portion of its annual funds from the Institute of Technology (the University's science and engineering college), the University Libraries, and endowment funds contributed by generous donors to CBI and the University over the years.

Additional Support
During the year, the NSF-sponsored Software History Project (NSF 9979981) provided additional funds to support staff in CBI.
We acknowledge a grant from the Charles Babbage Foundation.
The Unisys Corporation provided a generous contribution for support of archival activities.
John Diebold provided support to help with archival processing.

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Trent, Robert H.
Uda, Osamu
Wieselman, Irving L.
Wulf, Prof. William A & Prof. Anita Jones
Yoshida, Haruyo
Zabolitzky, Dr. John

6. CBI Staff in FY2003

Arthur L. Norberg, Ph.D.
ERA Land-Grant Chair in History of Technology
Director, Charles Babbage Institute
Professor, Department of Computer Science
Jeffrey R. Yost, Ph.D.
Associate Director, Charles Babbage Institute
Elisabeth Kaplan, M.A.
Associate Librarian, University Libraries
Archivist, Charles Babbage Institute
Philip L. Frana, Ph.D.

Manager, Software History Project
Carrie A. Seib, M.L.I.S.
Assistant Archivist, Charles Babbage Institute
Maria T. Plonski, M.L.I.S.
Project Archivist, Charles Babbage Institute
Dina L Kountoupes
Senior Administrative Specialist, Charles Babbage Institute

Undergraduate Student Employees (all part time)
David Berge
Archives Student Worker
Josh Knatterud-Hubinger
Archives Student Worker
Amanda Schwarze
Archives Student Worker

News from the Archives

Collections received:

Lloyd Thorndyke – ETA collection
In May 2003, CBI acquired approximately 7 cubic feet of records documenting the work of Lloyd Thorndyke, who started as an electrical engineer at the Control Data Corporation in 1960, and served in various executive positions with the company including Vice President of Engineering in the Peripheral Products Division and Senior Vice President of Technology Development. In the early 1980s, Thorndyke was chosen as President and CEO of ETA Systems, Inc., a CDC subsidiary manufacturer of supercomputers. He retired from ETA in 1989.

The bulk of the material received documents ETA activities, and includes articles of incorporation, bylaws, board meeting minutes, annual reports, and technical reports, as well as Thorndyke's dayfiles, speeches and writings. Also included are product literature, images, clippings, and a few artifacts.

Charles Babbage Portrait by Virginia Kolence
In June, Kenneth A. Kolence and Virginia Kolence donated an original framed oil painting of Charles Babbage. The portrait, which was painted by Mrs. Kolence, hung for several years in the

lobby of Boole & Babbage, the company co-founded by Mr. Kolence in 1967.

The painting now graces the office suite of the Charles Babbage Institute. In addition, an image of the painting can be viewed at the "Who was Charles Babbage?" virtual exhibit at http://www.cbi.umn.edu/exhibits/cb.html

Boole & Babbage was the first systems software product company in Silicon Valley. An oral history interview with Ken Kolence was conducted in Spring 2003 and will soon be available in full text on the CBI web site.

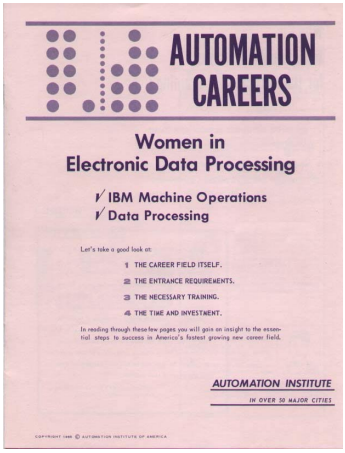
Literary Machines, by Ted Nelson
Jonathan Gross has donated a 1987 copy of Ted Nelson's book *Literary Machines*. This rare self-published book describes the Xanadu(tm) Hypertext System, a distributed document storage and retrieval system that was a precursor to the World Wide Web. Nelson is known to a popular audience as the coiner of the term "hypertext." A brief essay on *Literary Machines* is available at
http://www.iath.virginia.edu/elab/hfl0155.html

Martin A. Goetz
CBI received approximately one cubic foot of papers from Martin A. Goetz, founder of Applied Data Research. The new materials, most of which concern patent issues and legal problems, augment the existing ADR collection at CBI. The materials are now being integrated into the collection and the finding aid will be updated soon. Current versions of the finding aids for the Martin A Goetz Papers and the Applied Data Research Records are available at http://www.cbi.umn.edu/collections/archmss.html

Samuel D. Conte and Lotfi A Zadeh
Two oral history interviews were added to the CBI Oral History Database in July. Both were conducted in 1997 by Bill Aspray, former CBI associate director, who was then researching the history of the Purdue University Department of Computer Science Samuel D. Conte and Lotfi A Zadeh were faculty members of the department.

CDC Processing Highlight:

"Automation Careers: Women in Data Processing"



In 1955, Vernon D. Patterson, (president and general manager of Manpower, Inc.'s Western division), recognized the need to train prospective personnel in the field of data processing, then commonly referred to as "business automation."

This 1965 pamphlet illustrates efforts to recruit women for training on IBM sorters, reproducers, collators, card punches and accounting machines. Daytime and evening classes were available, but, as the brochure stated, "persons over 45 years old are normally not considered unless related education or

experience is evident."

By 1965 the Automation Institute of America had franchises in over 50 cities across the United States, the same year that the company was acquired by the Council for Economic and Industry Research, Inc. (C-E-I-R). In 1967, C-E-I-R, along with its Automation Institute subsidiary, was acquired by Control Data Corporation. A small amount of Automation Institute materials are available for research within the C-E-I-R series in the Control Data Corporation collection at CBI.

CBF Meets in Palo Alto

The Charles Babbage Foundation held their annual meeting in Palo Alto, California, on the weekend of May 17th. On Friday, CBF and the Software History Center co-sponsored a special workshop to discuss collection development and historical research related to software. The aim of this meeting was to get a better sense of the what various organizations are doing to advance software history, increase communication between these organizations, and avoid duplication of effort. Representatives from various organizations in whole or part involved with the history of computing and software were the primary participants, with CBF Trustees and others also taking part in the discussions. Organizations that sent representatives included the Association of Computing Machinery, Charles Babbage Foundation, Charles Babbage Institute, Computer History Museum, Hewlett-Packard Archives, Indiana University, *IEEE Annals of the History of Computing*, IEEE History Center, IFIP, Internet Archives, Smithsonian Institution, Software History Center, Stanford University, and University of Maryland.

CBF Chair James W. Cortada addresses CBF Trustees at Annual Meeting

The participants began by giving brief presentations on their respective organizations' past work, present activities, and future plans for collecting archival materials and/or conducting historical scholarship on software. CBI's Associate Director Jeffrey Yost and CBI Software History Project Manager Philip Frana represented the Institute and discussed the different reference tools produced by CBI's Software History Project, as

well as the Institute's two decade history of collecting significant archival material on the history of software.

A number of the historians in attendance emphasized the importance of engaging in collection development efforts in a manner that results in a representative body of resource materials that are then preserved, processed, and made available to scholars and other researchers. Additionally they focused on the need for historical scholarship to be broad enough to contribute to and extend an emerging historical literature addressing major issues and themes of software development and the evolution of, and the strategic management of firms within, the software and services industries.

On Saturday CBF Chair James W. Cortada and CBF President Luanne Johnson gave talks on the activities of CBF, fundraising efforts, support of the Charles Babbage Institute and the Software History Center, the ongoing CBF project to produce a history of computing portal, and other topics.

Jeffrey Yost gave an address on the work completed and ongoing projects of CBI during the past fiscal year (ending June 30, 2003). He detailed the new books and scholarly articles of CBI staff, the new resources created and now available on the CBI Web site as part of the Institute's Software History Project, collection development and processing activities, the Institute's service to the research community, and plans for future projects. These plans include projects on developing knowledge and competencies to initiate collection of born digital records at CBI, and research to advance resources and understanding of the history of computer security and privacy.

Burt Grad, President of the Software History Center, discussed the past work of his organization, including the ADAPSO Reunion and corresponding oral history project. Most of the 15 oral history interviews of software industry pioneers that were conducted by volunteering historians are now available on the Charles Babbage Institute Oral History Database on the CBI Website. The remainder will soon be added.

Computer Collections at the Smithsonian Institution Archives Center

Computing history is one of many subject area strengths of the Archives Center, National Museum of American History (originally named the National Museum of History and Technology). Several collections documenting computing history are described below.

Contact information:
Archives Center:
Smithsonian Institution
P.O. Box 37012

National Museum of American History
Room C340
MRC 601
Washington, DC 20013-7012

202.357.3270
archivescenter@nmah.si.edu
http://americanhistory.si.edu/archives/ac-i.htm
www.siris.si.edu (online catalog)

Computer Oral History Collection, 1969-1973, 1977
43. 5 cu. ft.
The Computer Oral History Project (1969-1973, 1977), was a cooperative project of the American Federation of Information Processing Societies (AFIPS) and the Smithsonian Institution. The project began in 1967 with the main objective to collect, document, house, and make available for research use source material documenting the development of the computer. The project collected taped oral history interviews (more than 200) with individuals who figured prominently in developing or advancing the computer field.

Odex I Walking Robot Collection, 1973-1986
.5 cu. ft.
This material documents the walking robot, Odex I of the Odetics, Inc., Anaheim, CA. The collection includes memoranda, notebooks, drawings, blueprints, photographs, and video cassette tapes related to the design and manufacture of the "first functionoid."

Data Processing Digest Collection, 1955-1974
16 cu. ft.
The Data Processing Digest is a monthly publication dealing only with material related to the computer industry. This collection includes magazine and newspaper clippings from various sources all related to the development of the computer industry.

B.H. Worsley Collection, 1946-1959
0.6 cu. ft.
This collection includes the personal papers of Worsley and other documents. Papers include handwritten notebooks, loose notes, memoranda, reprints from articles, copies of theses, manuals, and proceedings of several conferences of computer specialists.

Terry M. Sachs Collection, 1965-1969
1.0 cu. ft.
Collection consists of manuals for the operation of the IBM data processing systems and a training handbook for RCA field engineering manuals. Also included are several printouts of data in COBOL language.

Whirlwind Computer Collection, 1945-1959
9.3 cu. ft.
Project Whirlwind was sponsored by the Special Devices Center of the Office of Naval Research. This collection consists of summary reports, an index, bi-weekly reports, correspondence, memos, and reports relating to Project Whirlwind.

Computer Standards Collection, 1958-1978
4.6 cu. ft.
This collection was put together by Robert W. Bemer during his involvement in setting language and data standards for the early computer industry. The collection consists of correspondence, reports, publications, meeting minutes, and bulletins of standards committees relating to ALGOL, COBOL, and the International Standards Organization (ISO).

American National Standards Institute--X3L2 Committee Records, 1969-1979
3.3 cu. ft.
The American National Standards Institute (ANSI) X3L2 Standards Committee has responsibility for computer character sets and codes. Eric H. Clamons, of Honeywell Information Systems was the fifth chairman of the committee, from 1968 to 1972. The records are from his files. This material includes correspondence, handwritten notes, transcripts of speeches, meeting minutes, reports of ANSI, and clippings.

Paul Armer Collection, 1949-1970
5.0 cu. ft.
Paul Armer's collection consists of files from organizations--Association for Computing Machinery and American Federation of Information Processing Societies-- in which he was active. Included are minutes of meetings, correspondence, memoranda, published papers, rough drafts of articles, and reports, and summaries of meetings, and symposia.

Grace Murray Hopper Collection, 1944-1965
3 cu. ft.
Hopper's materials include technical notes, operating instructions and descriptions relating to projects that she participated in at Harvard and after World War Two and later in the private sector. Photographs of equipment, published articles and memoranda on technical aspects of computers, clippings of newspapers and magazine articles, periodicals, brochures, and a humor file are also included.

Institute for the Advanced Study Computer Project Records, 1950-1957
0.7 cu. ft.
This material was generated by participants in the Institute for Advanced Studies Computer Project. Included are published reports, of the staff of the Electronic Computer Project, monthly progress reports, and reports by individual staff members on particular problems or pieces of equipment. Numerous drawings of computer components are also included, together with ten glass photo slides in color of equipment and personnel.

Jacob Rabinow Papers, 1910-1917; 1947-1990
4.0 cu. ft.
This collection comprises material from three major areas of Rabinow's work in improvement of electronic and other devices: phonograph record players, optical character recognition, and automatic self-regulation of watches and clocks. Included are technical descriptions, engineering drawings and sketches, numerous patent applications, patents, photographs of devices, and correspondence.

James J. Childs Numerical Control Collection, 1952-1987
This collection documents the development of the numerically controlled machine tool industry and is comprised of correspondence, photographs, drawings, and trade literature.

The Computer World Smithsonian Awards, 1989-Present
52 + cu. ft.
This collection documents the cutting edge use of computer systems technology from 1989 to the present, as determined by an annual nomination and awards program jointly sponsored by *Computer World Magazine* and the Smithsonian Institution. The collection highlights the innovative use of computer technology in ten areas: business; education and academia; environment, energy and agriculture; finance, insurance, and real estate; government and nonprofit organizations; manufacturing; media, arts and entertainment; medicine; science; and transportation. Each category contains a number of nominees, whose computer systems are documented in a variety of formats (including written description, videotapes, photographs, and slides). One winner is selected from each category each year.

Association for Computing Machinery, Washington, DC Chapter, 1958-1978
285 microfiche
The Association for Computing Machinery was founded in 1947 as a forum for the professional computing community to exchange information and for professional development; the Washington, DC, chapter was founded in 1958. This collection consists of microfiche copies of the chapter's records, including council directories, minutes, treasurer's and committee reports, correspondence, reports on special interest groups within the chapter, and records related to the yearly symposium sponsored by the chapter.

Information Age Exhibition Records
30 cu. ft.
This collection consists of records created during the production of the "Information Age" exhibition at the National Museum of American History, which opened in 1990. They are records of various staff members involved in the project, particularly David Allison and John Eklund. In addition, there is a set of graphics notebooks, which illustrate the artifacts, and graphics that appear in the exhibition.

SHARE Numerical Analysis Project Records, 1964-1970
5 cu. ft.

SHARE was an informal meeting of computing personnel that formed in response to the number of assembly programs and the amount of redundancy that was occurring in the computing field. In 1955, a meeting was called for all companies involved in computer manufacturing. The collection includes correspondence, committee meeting minutes, SHARE General Library Abstracts and Reports.

Robert G. Chamberlain Numerical Control Collection, 1954-1984
2.5 cu. ft.
Chamberlain was involved in the early development of technology and processes for the computer-programmed control of heavy machinery, known in the industry as numerical control (NC). Chamberlain's collection includes personal recollections, numerous speeches, articles, projects, and slides.

Max Holland Machine Tool Industry Collection, 1941-1995
4 cu. ft.
The collection consists of numerous documents, promotional materials, correspondence, press clippings, trade journals, and reports relating to the machine tool industry and one of its main components, the Houdaille Corporation. The material was assembled by max Holland, journalist and author, for his book, When the Machine Stopped (1989), which studies Houdaille, its role within U.S. Machine tool industry, and the competition it faced from Japan in the 1980s.

Gordon Goldstein Computing Collection, 1949-1956
2 cu. ft.
This collection relates to the design and development of software for early computers, particularly the UNIVAC.

SHARE Records, 1955-1984
16 cu. ft.
This collection documents SHARE, a computing group that formed in 1955 and which was the first computer user group in the United States. The materials include SHARE Proceedings, SHARE Secretary's Distributions, computer manuals, and other papers.

Clifford Shaw Papers, 1950s-1960s
20.5 cubic feet
The Shaw Papers document the career of Clifford Shaw, a computing pioneer. Shaw (1922-1991) worked in the general field of artificial intelligence during the 1950s-1960s. The papers include records that document Shaw's work at RAND in developing the JOHNNIAC computer and the JOSS Program. Materials consist of working notes, manuals, experiment logbooks, calculations, and work on derivative programs.

Institute for Advanced Study: Electronic Computer Project Drawings, 1949-1961
2 cubic feet
Collection consists of correspondence, personal notes, articles, drawings, and published reports documenting the Institute for Advanced Study (IAS) Electronic Computer project,

1949-1956. The office of Naval Research contracted with IAS to study and document the operation and engineering improvements of the electronic computer at IAS from July 1, 1952 to June 30, 1953.

Alison Oswald, Archivist, Lemelson Center for the Study of Invention and Innovation, National Museum of American History, Smithsonian Institution

Recent Publications

Agar, Jon. *The Government Machine: A Revolutionary History of the Computer* (Cambridge, MA: MIT Press, 2003).

Akera, Atsushi. "IBM's Early Adaptation to Cold War Markets: Cuthbert Hurd and His Applied Science Field Men" *Business History Review* 76 (Winter 2002): 767-802.

Caminer, David Tresman. "Behind the Curtain at LEO: A Personal Reminiscence" *IEEE Annals of the History of Computing* 25:2 (April-June 2003): 3-13.

Ceruzzi, Paul. *A History of Modern Computing, Second Edition* (Cambridge, MA: MIT Press, 2003).

Gray, George T. and Ronald Q. Smith. "Before the B5000: Burroughs Computers, 1951-1963" *IEEE Annals of the History of Computing* 25:2 (April-June 2003): 50-61.

Jones, Cliff B. "The Early Search for Tractable Ways of Reasoning About Programs" *IEEE Annals of the History of Computing* 25:2 (April-June 2003): 26-49

Langlois, Richard. "Cognitive Comparative Advantage and the Organization of Work: Lessons from Herbert Simon's Visions of the Future" *Journal of Economic Psychology* 24:2 (April 2003): 167-187.

Light, Jennifer. "Before the Internet, There Was Cable" (Think Piece) *IEEE Annals of the History of Computing* 25:2 (April-June 2003): 96+.

Schroeder, Katherine and Suzanne E. Taylor. *Inside Intuit: How the Makers of Quicken Beat Microsoft and Revolutionized an Entire Industry* (Boston: Harvard Business School Press, 2003).

Slater, Don. "Modernity Under Construction: Building the Internet in Trinidad." In Thomas J. Misa, Philip Brey, and Andrew Feenberg, eds. *Modernity and Technology* (Cambridge, MA: MIT Press, 2003).

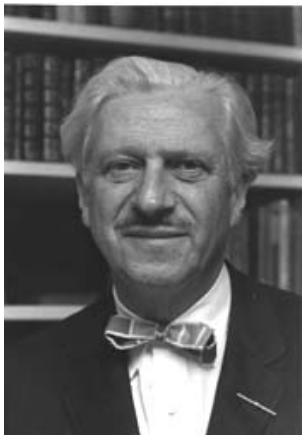
Stachniak, Zbigniew. "The Making of the MCM/70 Microcomputer" *IEEE Annals of the History of Computing* 25:2 (April-June 2003): 62-75.

Staley, David J. *Computers, Visualization, and History: How New Technology Will Transform Our Understanding of the Past* (Armonk, NY: M.E. Sharpe, 2003).

West, Jonathon and Marco Iansiti. "Experience, Experimentation, and the Accumulation of Knowledge: The Evolution of R & D in the Semiconductor Industry" *Research Policy* 32:5 (2003): 809-825.

Compiled by Jeffrey R. Yost

I. Bernard Cohen, 1914-2003



Victor S. Thomas Professor of the History of Science Emeritus and longtime Charles Babbage Foundation Trustee I. Bernard Cohen died at his home in Waltham, Massachussetts, on June 20, 2003. Cohen was a pioneer in the history of science and a renowned scholar of Sir Isaac Newton. He produced the first translation (completed in 1999) of Newton's *Principia: Mathematical Principles of Natural Philosophy* since 1729, and received wide acclaim for this important contribution.

Cohen, a gifted lecturer and educator whose teaching career at Harvard began in 1942, distinguished himself in many areas of history of science and technology. He wrote the most respected scholarship to date on the scientific work of Benjamin Franklin, producing two important books, *Benjamin Franklin and the American Tradition* (1953), and *Franklin and Newton: An Inquiry into Speculative Newtonian Experimental Science and Franklin's Work on Electricity* (1956).

Cohen also became a leading scholar and editor in the history of computing. In 1999 he published *Howard Aiken: Portrait of an American Pioneer* and edited a second volume on Aiken entitled, *Makin' Numbers: Howard Aiken and the Computer*. Additionally, Cohen was the longtime editor of an MIT University Press series on the history of computing.

Cohen served many organizations and received countless honors during his highly accomplished career. He was a founding member of Harvard University Kennedy School of Government's Seminar in Science and Public Policy; he served as Chair of the U.S. National Committee for the History and Philosophy of Science, and was President of the History of Science Society and the International Union of the History and Philosophy of

Science. He won the George Sarton Medal for lifetime achievement from the History of Science Society. In 1995 he was elected to the American Philosophical Society.

Cohen is survived by his wife of 19 years, Susan Johnson; his daughter, Frances; two stepsons; and a granddaughter. CBI is grateful for the assistance and advice Cohen provided to CBI and CBF over the years and we offer our best wishes to his family.

Jeffrey R. Yost

Featured Photos: From Geniacs to Brainiacs

Young man with Brainiac kit, ca. 1959.

The Geniac (Genius Almost-Automatic Computer) Kit No. 1 made its debut in March 1955 at the annual American Toy Fair in New York City. This "electric brain construction kit" was conceived by Edmund Berkeley, founder of Berkeley Enterprises, Inc. and author of the first book on electronic computers for a general audience, *Giant Brains, Or Machines That Think* (1949). The kit contained all of the simple equipment needed to build 33 simple electric brain machines, called Geniacs, including six multiple switches and about 400 hardware parts. Each Geniac ran on one flashlight battery and all connections were made with nuts and bolts, so no soldering was required. The accompanying instruction booklet included descriptions of 33 Geniacs to build with the kit, such as "the uranium shipment and the space pirates," an intelligence testing machine, a flashlight, a special combination lock, a masculine-feminine testing machine, and a machine to play Tit-Tat-Toe.

An ad for the Brainiac K17 kit (predecessor to K20), Popular Electronics *February 1959*

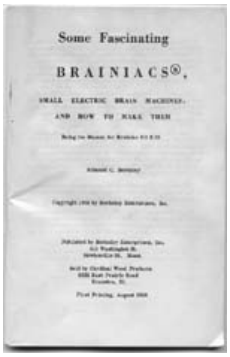
The BRAINIAC K20 kit, ca. 1958 – box cover

Berkeley Enterprises constructed its first miniature automatic computer in 1950 and called it Simon. Although the company sold kits to build Simon, materials alone cost over $300 and it was considered too expensive for playing and teaching situations. So the company developed the

The BRAINIAC K20 kit, ca. 1958 – contents inside of box

less expensive Geniac kit in 1955 and the Tyniac (Tiny Almost-Automatic Computer) kit in 1956, both of which sold for less than $20. In 1957 the company introduced the Brainiacs (Brainy Almost-Automatic Computers) and soon after started consolidating all of the electric brain machines together into Brainiac kits.

The Brainiac K20 kit was debuted in 1958 at $9.95. The kit included four multiple switches and about 300 parts needed to make a selection of 31 Brainiacs from the Brainiac K17 kit (which included 151 Brainiacs), including puzzles, game-playing machines, arithmetical machines, and reasoning machines.


Some Fascinating

BRAINIACS®,

Some Fascinating BRAINIACS, Small Electric Brain Machines, and How to Make Them, Being the Manual for Brainiac K20, 1958.

-Carrie Seib


ANNOUNCING THE SMALLEST ALMOST-AUTOMATIC COMPUTER:

GENIAC

Electric Brain Construction Kit No. 1

Geniac flyer, 1955.

All of the images accompanying this article depict materials in the Edmund C. Berkeley Papers (CBI 50), Charles Babbage Institute, University of Minnesota, Minneapolis.

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