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CBI Awarded Major Grant to Study NSF System

This summer CBI secured a three-year grant to do an evaluative history of the National Science Foundation's (NSF) FastLane system. For those who might not be familiar, FastLane is the all-embracing computer infrastructure that supports NSF's core mission of grant-making.

Everything about grant-making at NSF flows through FastLane: researchers learn about grant opportunities, they submit grant proposals, reviewers download proposals and submit their evaluations, panels consider rounds of applications, money flows out to research institutions, and in time, researchers file their project reports. Since 2000, use of FastLane has been mandatory for all NSF grant proposals.

Despite having won numerous awards for innovative uses of information technology in the federal government, FastLane has no proper history and little available documentation. It is an instance of computerization by a major government agency that needs to be known. I learned about this curious opportunity, some years back, when visiting a historian-colleague then serving as a rotating NSF program officer. "FastLane is changing NSF top to bottom," he told me, "but NSF is too busy to find out how this is happening."

A series of conversations with NSF staff members and executives helped us shape this project. Last year, we secured a modest one-year grant to launch the project. This small grant for exploratory research allowed us to develop research tools and do preliminary interviewing. Now, with this three-year award from NSF's Human Centered Computing program, we have the resources necessary to do a full-scale historical assessment of how FastLane was designed and implemented as well as assess its consequences for the nation's research system. Total NSF support for the project now exceeds \$500,000.

CBI staff will conduct oral histories with FastLane's dozen or so designers and its myriad of diverse users as well as assemble a documentary record. We are also developing an innovative web-based interview platform to tap into and record the experiences of NSF staffers, principal investigators, and sponsored projects staff. The immense numbers of potential interviewees—there are roughly 1,000 NSF staffers and 30,000 PIs—require an alternative research strategy alongside CBI's tried-and-true research-grade oral histories. The project is supporting University of Minnesota Ph.D. student Joline Zepcevski, who is designing, developing, and piloting a linked database and website. Respondents using this site can complete a self-paced interview as well as upload digital files for archiving. We are designing this research tool to be "portable" for other research efforts, in computer history and beyond. As reported elsewhere in this newsletter, we gave a paper outlining the project and showing off the pilot version of our web-based interview platform at the recent annual meeting of the Society for the History of Technology meeting in Lisbon, Portugal.

Thomas J. Misa

International Conference at CBI

The Charles Babbage Institute hosted a successful international conference–workshop during 30-31 May 2008 on the critically important theme of gender and computing. The two-day event, featuring invited presenters from six countries, explored the “gender gap” in contemporary computing through their historical studies. The event was a blend of outreach to a general public audience during the first “conference” day and more specialized scholarly activities during a second “workshop” day. We are thankful for financial support from the German Research Council, the University of Minnesota’s Institute of Technology Dean’s Office, graduate program in History of Science and Technology, and Office of International Programs, as well as the university’s departments of computer science and electrical engineering. Contributors included well-known computer historians, practicing computer scientists and educators, as well as researchers in allied disciplines, and a number of younger scholars.

Computer historians are now well aware of the significant achievements of women during the early days of computing. As Kay McNulty, one of the famous ENIAC women, phrased their achievement, “Somebody gave us a whole stack of blueprints, ... the wiring diagrams for all the panels, and they said ‘Here, figure out how the machine works and then figure out how to program it’.” McNulty and her peers taught ENIAC to solve differential equations for ballistics calculations. Other notable women in the early days of computing and computer science include Gertrude Blanch, Frances “Betty” Snyder Holberton, Jean Sammet, and the iconic Grace Hopper. (CBI is pleased to have the archival papers of Blanch and Holberton as well as the Association of Women and Computing fully accessible to researchers, in addition to other research resources on gender and computer as itemized in the Spring 2008 newsletter.) Encouraged further by the women’s movement, female students by the early 1980s were collecting nearly two-fifths of all computer science bachelor’s degrees in the U.S.

Not so well known, however, is that women’s participation in computing education since the mid 1980s has plummeted. According to current figures from the National Science Foundation, women now gain just one in five computing bachelor’s degrees, and there have been corresponding tail-offs in the labor force. These figures might be even worse if NSF had not made hefty investments encouraging the participation of women in computing and other science and engineering fields.

The CBI conference aimed to discover a “missing piece” to help understand women’s apparent departure from computing. On Friday, 30 May, presenters and audience members tried to pin down when, how, and why women, despite their early prominence in computing, so often faced persisting barriers. Presenters examined computing in offices, schools, libraries, and in the mass media, as well as the computing profession itself. Greg Downey and Corinna Schlombs discussed their studies of computer-driven automation in libraries and offices, locating examples of blatant discrimination against women as well as subtle instances of blindness or inattention to technical changes that were reshaping gender relations in the workforce. Hilde Corneliussen and Hara Konsta analyzed advertisements and other media reports that provide a window into popular culture. The stereotyped sexist advertisements are familiar enough.

A more serious problem is when women’s successes with computing are made invisible. Media attention is frequently given to the (exceptional) men who are computer experts as well as to those women who, like most men, may be less-enthusiastic users of computers. For effective

change strategies, we need to better understand how institutions and the mass media help shape perceptions of gender and computing, which can lead to self-fulfilling prophecies.

After lunch, conference attendees had a chance to learn about additional innovative projects in a set of poster presentations as well as to view the newly installed special exhibit, “Gendered Bits.” (see related article) The exhibit, curated by CBI archivist Arvid Nelsen, featured pamphlets, books, images, and artifacts drawn from CBI’s collection as well as Diane Close’s distinctive computer-themed “Internet Quilt.” Poster presentations on gender and computing in Canada, Britain, and the former Soviet bloc added much-needed comparative perspectives. In the afternoon, Nathan Ensmenger, Caroline Hayes, and Thomas Haigh discussed varied assessments of women’s changing reception in the computing professions while Irina Nikiforova presented a case study of Seymour Papert’s LOGO, the MIT effort at gender-neutral children’s computer learning. An evening reception and conference dinner provided additional time for elaborating the day’s ideas and for informal networking.

The conference presenters and organizers reconvened for a full-day workshop on Saturday, 31 May, beginning with a “laboratory session” designed to facilitate small-group interaction. Here the workshop attendees considered the content and implications of two dozen computer-and-gender images from CBI’s extensive photo collection as well as the “Gendered Bits” exhibit. In the afternoon, participants elaborated a set of research questions and research strategies, discussed publication venues, and began planning for a follow-up conference in Germany. The event’s program committee consisted of Janet Abbate (Virginia Tech), Tom Misa (CBI), Veronika Oechtering (Bremen), and Jeff Yost (CBI). The conference website at <www.umn.edu/~tmisa/gender> includes the full titles of papers and posters, along with paper abstracts, a working bibliography of publications and websites, and numerous photos from the event, including the images viewed in the laboratory session.

Follow-up includes write-ups by Corinna Schlombs (Tomash Fellow ‘08) and myself in *IEEE Annals of the History of Computing* as well as a nationally distributed news story <<http://www.aip.org/isns/reports/2008/023.html>>. We are taking steps to publish an edited volume based on the conference presentations, and Veronika Oechtering is planning a follow-up conference at the University of Bremen.

Thomas J. Misa

Director’s Desk

These days a quiet hum greets the visitor walking into CBI’s office suite. We have our usual number of visiting researchers, working in the nearby Andersen Library reading room. Recent visitors include this year’s Tomash Fellow, Ian Walsh (Boston College), as well as one of the Norberg travel-grant winners, Bernardo Batiz-Lazo (University of Leicester). The office hum comes partly from the three researchers who are at work on the 75th anniversary history of the Institute of Technology and based in the CBI office suite. Nathan Crowe and Maggie Hofius are both Ph.D. students in the history of science, technology and medicine program, while Ron Frazzini is a recent Ph.D. and former Tomash Fellow. Bob Seidel and I are meeting with them on a regular basis around our conference table, planning lines of research as well as strategies for interviewing faculty, staff and alumni. Weekly meetings for the NSF-funded study of FastLane,

reported elsewhere in this issue, add yet other activity to the CBI suite. A further significant development is that the ACM archiving project started this month, with the arrival of project archivist Lorelee Bloom and her student assistant. Last Friday we received the second of two huge pallets of records shipped from ACM headquarters in New York. We've also given a score of VIP tours to the Andersen Library "caverns" in recent weeks. All in all, the picture is that CBI is a pleasantly busy place.

Even as CBI's 15 million or so pages of paper records remain our core concern, electronic records and electronic archiving are emerging areas of activity. Early on, CBI placed research materials on the World Wide Web, most notably in the form of digitized PDF versions of our oral histories. Today, our website has selections from the massive Burroughs photo collection available (a searchable database of more than 500 images) as well as a growing selection of "CBI hosted publications" including digitized version of *Connexions* (the Internet journal), bibliographies, reports, and memoirs, in addition to searchable finding guides to our archival collections. Soon to come will be digitized versions of a sizable part of CBI's collection of audio and videotapes, and films. We have secured funding through a special University Libraries grant that will create digital versions of several hundred VHS and U-matic format films. For the moment, we will be moving slowly on our existing archive of 15 million paper pages—it takes roughly a dollar a page to hand-scan at an archival level of care, though we can (destructively) scan second copies of books much cheaper. Still, we are taking steps to make sure that we are archiving the "last" generation of paper records as well as the "first" generation of born-digital electronic records.

Jeffrey Yost is clearly hitting his stride as Editor-in-Chief of *IEEE Annals of the History of Computing*, the leading journal in the field. In January Jeff took up the editorial baton from David Grier, and he has been hard at work managing his editorial team as well as recruiting outstanding scholarship, literally from around the world. In July Jeff hosted the annual board meeting of the journal, a time to strategize about the journal's future as well as to keep the journal healthy and the community that surrounds it vital and dynamic. This fall *Annals* will publish a thematic issue on international computing, and there are special issues in the works on Asian language processing, computer gaming, database management systems, and more. Since we are in the midst of our annual fund-raising campaign, I should mention that we send the four quarterly issues of *Annals* to each of the contributors to our CBI Friends program. You can join today with a modest contribution of just \$100. It is a wonderful way to support CBI and computer history. Drop us a line and we'll be more than happy to send you a letter or email with the complete details.

Thomas J. Misa

Minnesota's 'Hidden History' in Computing

CBI is pleased to be offering an evening lecture series this academic year on “Minnesota’s Hidden History in Computing.” People in the computer world know there is an important story about Minnesota’s pioneering computing work, and it needs to be shared with the wider community. Certainly in the 1950s and 1960s, and even into the 1980s, Minnesota was a leading region in the United States for computing. Companies that were active here were among the leaders in the industry, especially before the blossoming of the Route 128 minicomputer industry outside Boston and the microcomputer, software, and networking industries of Silicon Valley. Minnesota’s history of computing has been hidden partly because it was overshadowed by these later developments. It was also literally hidden in that many Minnesota companies had their greatest technical successes while working on classified military, aerospace, or cryptographic projects. These achievements have been difficult to see since engineers, researchers, and business leaders could not talk openly about their classified work to neighbors, family or friends. People in the wider community literally did not have a clue what was going on.

In September my first talk surveyed Minnesota’s computing accomplishments, asking whether Minnesota might have reasonably claimed the mantle that Silicon Valley later did so successfully. Minnesota companies pioneered magnetic storage technology, leading to IBM’s great success with its magnetic-drum computer, the Model 650, as well as forming the foundation for the hard-drive giant Seagate today. An early computer industry also formed in the Twin Cities, with many characteristics that would later typify Silicon Valley, such as employee stock ownership and substantial mobility for engineers.

For October I examined the founding and legacy of the Engineering Research Associates (ERA). Notably, ERA operated a stored program computer in the middle months of 1950; the machine was designed, built, and tested in St. Paul, packed up and delivered in Washington DC, and then installed and working for the precursor of the National Security Agency by December of that year. Most historians have pointed to the two National Bureau of Standards machines (SEAC and SWAC), which were completed and went into operation between May and August of 1950, as the first U.S. stored program computers. It is an exciting historical development that a group at Lockheed-Martin has recently discovered a cache of historical engineering notebooks from ERA, stretching all the way back to 1950. These new documents may help us clarify ERA achievements as well as help understand just what it means to have a “working” computer.

In months to come we will delve into Control Data, Unisys, and Honeywell, and in the spring we’ll examine IBM–Rochester, its Blue Gene supercomputer, the University’s GOPHER client (an early version of the World Wide Web that was popular in the early 1990s), and the region’s impressive profile in medical computing. If you happen to be anywhere near, please come join us on the third Wednesdays of these months!

Thomas J. Misa

Gendered Bits: Identities, Practices, and Artifacts in Computing, an Exhibit

The Charles Babbage Institute was selected by the Exhibits Committee of the Department of Archives and Special Collections to mount an exhibit in the exhibit space in the first floor atrium of the Elmer L. Andersen Library from May 28 to July 23, 2008. The exhibit, *Gendered Bits: Identities, Practices, and Artifacts in Computing*, was designed to complement the conference “History | Gender | Computing” hosted by CBI May 30-31. CBI Archivist R. Arvid Nelsen, curator of the exhibit, used resources from the collections at CBI and examined how social concepts of gender affected jobs and training opportunities available to people, expectations of interest in computers, and how computer products and services were marketed.

The exhibit started with materials pulled from the Burroughs Collection, which contains materials dating from the 19th century when the company manufactured adding machines and other office equipment. This segment of the exhibit demonstrated how office roles were gendered as masculine or feminine over time. Subsequent segments of the exhibit showed how certain office roles remained largely feminized and examined how emerging computer programming and related positions were primarily marketed to men. Marketing was also examined in terms of how computers as products were advertised and the assumptions those ads made about who would be purchasing and using the machines. Children’s literature and games also revealed how boys or girls were encouraged to think about computing.

The exhibit also featured materials from CBI’s collections of women in computing, including Gertrude Blanch, Margaret R. Fox, Claire K. Schultz, Florence R. Anderson, and the Association for Women in Computing. One very special item featured in the exhibit was a quilt loaned to CBI by Diane Barlow Close. This quilt was a collaborative project created as a thank you by fans of the newsgroup “rec.crafts.quilting,” which Diane established in the summer of 1993 as an online space for women in the computer industry who were avid quilters.

The exhibit materials and text were shown off wonderfully thanks to the design skills of Andersen Library’s resident exhibits designer, Darren Terpstra, who created the color scheme and design elements that inhabited and framed all of the materials. Of special note were the mannequins that welcomed visitors and featured clothing inspired by photographs from the Burroughs Collection and computer-monitor “heads” bearing quotes drawn from materials on display.

I would like to thank everyone who helped identify potential materials for the exhibit and provided feedback during its creation and after it was mounted. An online version of the exhibit, to be added to CBI’s website, is currently in development.

R. Arvid Nelsen

ACM Archives

The Charles Babbage Institute is the new home of the historical records of the Association for Computing Machinery. One year ago CBI participated in a competitive bidding process for the collection and received word of the success of our proposal in January 2008. In addition to the collection, the gift included monetary support for the transfer of materials and for a project archivist and student assistant to process the materials.

Materials selected for inclusion in the collection to be held at CBI were identified in two different projects. First, in 2005, then-CBI Archivist Elisabeth Kaplan and then-Assistant Archivist Carrie Seib travelled to the ACM offices in New York to assess currently held materials and make recommendations for long-term retention and preservation. This past summer current CBI Archivist R. Arvid Nelsen went to the new ACM offices to identify the locations of materials previously recommended as well as to consult with various department heads and examine additional materials to be retained.

About half of the materials identified for housing at CBI arrived on August 2nd at our offices in the Elmer L. Andersen Library on the West Bank of the University of Minnesota, Twin Cities. The remaining boxes arrived on October 24th. Materials include (but are not necessarily limited to) minutes, reports, correspondence, and publications from originating units such as Publications, Member Services, the Executive Director's Office, Administration, SIG Services, Marketing, and Policies & Procedures. Further information will be available as collection processing is completed.

The Project Archivist for the records of the ACM, Lorelee J. Bloom (“Lora”), started work at CBI on Monday, Sept. 29. Lora has many years of experience in archives and libraries, including ten years with the Minnesota Historical Society as the Archivist for the records of the 3M Corporation. She will be with CBI for nine months, working solely on processing the ACM records, in a position generously funded by the ACM. Lora also has a student assistant for the project, Valerie MacDonald, who previously worked in Andersen Library on a large-scale processing project in spring 2008. In addition to a completed online finding aid, the project will also include the creation of a web page on the history of ACM. A physical exhibit and celebration to promote the completed project will be announced later.

R. Arvid Nelsen

Exploring the Archives: Resources on Computer Security

The following article is the fourth in a series highlighting materials in the CBI collections. The topics in this series have been chosen both for their historical significance as well as to call attention to materials/collections that may not be known to the research community.

Broadly defined, computer security is the subset of information security relating to computer use. Computer security is both a rapidly growing academic sub-discipline within computer science

and the basis for a major segment of the software and IT services industries. The primary annual computer security conference, RSA Conference, a small affair of several dozen people when it first convened in 1991, has grown to become one of the largest computer conferences in the world with many thousands descending on San Francisco each winter for the event.

Computer security includes physical security, or physical access to computers; kernels of operating systems that impose rules to avoid “trusting” certain programs; and programming techniques and products to create reliable tools to prevent and resist subversion (malicious hacking, viruses, worms, etc). Despite the tremendous importance of computer security to protect against cyber-terrorism, other computer crime, and to ensure the privacy of organizations and individuals (medical, financial, educational, etc.), it has received relatively little attention in the historical literature. Two books by Donn Parker that analyze and identify appropriate responses to computer crime are important sources: *Crime by Computer* (Scribner 1976) and *Fighting Computer Crime* (Scribner 1983). Both works draw on history to understand the evolution of computer crime and computer criminals.

More recently, Karl de Leuw and Jan Bergstra published a major edited volume entitled *The History of Information Security: A Comprehensive Handbook* (Elsevier 2007). In this 887-page book, computer scientists, social scientists, and humanities scholars examine information security broadly through the ages. The book includes chapters in five thematic sections: intellectual ownership, identity-management, communications security, computer security, and privacy and export regulations. In addition to numerous chapters related to the history of computer and software security in other sections, the computer security section’s six chapters focus directly on this topic: computer security standards, security models, computer security through correctness and transparency, IT security and IT auditing, internet security, and computer crime.

There are substantial, publicly available archival resources to study aspects of computer security at the Charles Babbage Institute (CBI). CBI has two major collections focused directly on computer security: Willis H. Ware Papers and Donn B. Parker Papers. In addition to these important resources, a number of other collections, including the Herbert S. Bright Papers, Walter L. Anderson Papers, and Carl Hammer Papers, contain significant materials.

Willis Ware provided critical early leadership to computer security research. In the first decade of digital computers (mid-1940s to mid-1950s), physical security and electronic radiation were the primary focus. In military and other installations requiring tight security, guards and alarms were the primary tool for physical security. Various “Tempest” standards were developed to either block or create “noise” to inhibit the deciphering of electronic radiation. Computer security, however, became far more of a challenge as time-sharing, which originated with MIT’s Whirlwind project in the early 1950s, became increasingly prevalent by the mid-1960s. RAND scientist Willis Ware, who became the longtime chair of RAND’s Computer Science Department, led a Defense Science Board task force in 1967 on computer security—the first in-depth examination of the topic/problem. Work within and outside the Department of Defense (DoD) in the 1970s—by James Anderson, David Elliott Bell and Leonard J. LaPadula, and others—established key computer security principles that were extended and formalized in the Department of Defense’s *Trusted Computer System Evaluation Criteria*, more commonly referred to as “The Orange Book” first published in 1983. This influential book set standards for rating security levels of systems for DoD procurement, and also influenced standards outside the defense arena.

In the late 1960s and early 1970s, the American public became increasingly concerned about computer databases and personal privacy of financial, medical, and other data. These concerns were reflected in and fueled by popular books on the problem by Alan Westin (*Privacy and Freedom*, Bodly Head, Ltd., 1970) and Arthur Miller (*The Assault on Privacy*, Signet, 1972). Willis Ware became a leader in the field of computer privacy in the late 1960s. CBI's Willis Ware Papers thoroughly document Willis Ware and others' work on computer privacy.

The Willis Ware Papers contain records on the Department of Health, Education, and Welfare's Advisory Committee on Automated Personal Data Systems (ADPS) and the Privacy Protection Study Commission (PPSC). Ware became the chair of the ADPS, a group that was launched in 1972 to address the "...growing concern about the harmful consequences that may result from uncontrolled application of computer and telecommunication technology to the collection, storage, and use of data about individual citizens." The records include transcripts of the majority of meetings of this body, as well as publications, memoranda and statements. that were distributed and studied by committee members. The ADPS published its assessments in a report entitled *Records, Computers, and the Rights of Citizens* in 1973. This document was central to the development of the Privacy Act of 1974.

The Privacy Act of 1974 recognized the need to further investigate a range of privacy issues related to the collection, storage, and transmission of data on computer systems by government and within the private sector. To facilitate this, it created the Privacy Protection Study Commission. Willis Ware served as vice-chair of the PPSC, which convened numerous times between 1975 and 1977. The Ware Papers include transcripts of these meetings, hearing summaries, statements, presentation materials, background notebooks, draft recommendations, reports (annual reports and a final report), and miscellaneous committee records. Among the many topics explored in these meetings and reports were privacy of medical records, insurance data, educational records, credit card and reservation systems, employment and personnel records, private investigation records, public assistance and social services records, credit reporting, and social security administration records.

Donn B. Parker worked as a programmer, researcher, and manager for General Dynamic Corporation, and later Control Data Corporation, before joining Stanford Research Institute (SRI) in 1969 as director of computing resources. For the next three decades he engaged in pioneering research and analysis of computer crime. This work was funded primarily by the National Science Foundation, but he also received support through the years from the United States Department of Justice, the DoD, and SRI's International Information Integrity Institute (I-4). I-4 was a membership organization providing confidential security risk management assistance for leading international corporations. Parker founded I-4 in 1986 and was the first director. He is widely recognized as one of the world's foremost authorities on computer crime.

Parker and his SRI colleagues collected and categorized the largest amount of reported computer crime material in the world, and created the most complete list of information abuse methods. This served as the source data for numerous reports, talks, and books by Parker and his colleagues on computer crime and computer abuse. The majority of this collection of over 30 linear feet of records is made up of SRI computer abuse and crime case files from 1958-2001, and collected material (clippings, articles, field investigations, interviews, reports) analyzed to create case files. There are four main categories of case materials: physical destruction (of facilities, hardware, software, etc.); intellectual property deception, fraud, and theft of rights; financial deception and embezzlement/fraud; and unauthorized use of services/data (including hacking and cracking).

In addition to the SRI Computer Crime Case Files and source materials, the Parker Papers also include transcripts of talks by Parker, subject files, various writings, records on Parker's professional activities, and audio/visual materials. The subject files include an excellent collection of computer security articles and reports, while his professional activities materials include writings and documents on the Data Integrity Project (1987-1991), ethics in computer science, and records from his involvement in various professional organizations, including the Association for Computing Machinery's Professional Standards and Practices Committee.

After graduating from University of Michigan in physics, Herbert Bright worked on radar and gunfire control at Western Electric during the latter part of World War II. He later worked in various technical and managerial positions at Westinghouse Bettis, CBEMA, Philco, and the Radiological Defense Laboratory.

In 1966, Bright founded and served as president of Computation Planning, Inc. (COMPLAN), a consulting firm focused on the analysis, design, programming and management of computation systems. After 1975, COMPLAN concentrated its operations on information security through cryptographic control. Bright co-invented a patented encryption system used by many major companies, government agencies, and organizations for data security. His professional interest in encryption led to his active participation in the ANSI-X9.E9 Working Group on Financial Institution Cryptographic and Authentication Key Management. The Herbert S. Bright papers have some records of COMPLAN from the late 1960s through the mid 1980s. This includes encryption algorithm records from 1984.

CBI also has various documentation on computer security in other archival collections. This includes numerous reports, transcripts, and documents on computer security between the early 1970s and the early 1990s in both the Walter A. Anderson Papers and the Carl Hammer Papers. Additionally, there is a wealth of government, industry, and other reports on computer security in the National Bureau of Standards Computer Literature Collection.

Complementing these materials, CBI has a small collection of career oral histories with pioneers in computer security. This includes interviews with Willis Ware, Donn Parker, Martin Hellman, and James Bidzos. These were conducted by Jeffrey Yost, in part, as background research for his survey chapter on the history of computer security standards in the de Leeuw and Bergstra volume.

Hellman, in partnership with Whitfield Diffie and Ralph Merkle, developed public key encryption. This pathbreaking discovery involves use of mathematically related public and private keys. The system allows two parties, without prior knowledge, to communicate privately over insecure communications channels. This along with other fundamental developments, particularly MIT's Ron Rivest, Adi Shamir, and Leonard Adleman's (RSA) public key algorithm for digital signatures, changed the face of cryptography and computer security. Rivest, Shamir, and Adelman initiated a venture, RSA Data Security, to capitalize on their research. The company struggled initially and was turned around soon after James Bidzos signed on as its president and chief executive in the early 1980s. Bidzos was one of the true pioneers of the software security industry. He initiated the RSA Data Security Conference (now RSA Conference) and was central to the launch of VeriSign as a spin off. Bidzos went on to serve as vice-Chair and is currently the Chair of the Board of VeriSign, Inc. Several other oral histories in CBI collections also deal meaningfully with computer security, including W. Richards Adrion's oral history conducted by William Aspray—where Adrion discusses NSF's funding of cryptography during the mid to late 1970s and its relation to the National Security Agency.

Publicly available historical resources on computer security of note outside CBI include a project at University of California-Davis to collect and disseminate online (and on CDs) early seminal papers on computer security. More than two-dozen PDF's of seminal papers are currently available online at <http://seclab.cs.ucdavis.edu/projects/history/seminal.html>

CBI hopes to build upon its strengths in archival materials on the history of computer security. If you have materials you might be interested in donating, please contact CBI Archivist Arvid Nelsen (nels0307@umn.edu).

Jeffrey R. Yost

SHOT Annual Meeting 2008

The Society for the History of Technology (SHOT), which holds its annual meeting in Europe every fourth year, met in Lisbon October 11-14, 2008. This meeting had 66 sessions on a wide range of topics and themes in the history of technology—including several sessions and a number of individual papers on the history of computing and software.

Prior to the meeting, research groups within the European Science Foundation-funded “Inventing Europe” held a pre-conference set of workshops involving individual meetings of the six research groups as well as combined meetings. The research group, “Software for Europe,” which is led by Gerard Alberts, discussed progress on various projects and engaged in planning for future publications. Many members and associate members of the “Software for Europe” group will be presenting papers on computing and software history at an upcoming Inventing Europe conference in Amsterdam (January 2009), “Appropriating America.”

There were four SHOT sessions directly on the history of computing. The first, “Looms, Chips, Users, and Code: The Business of Computing” was organized by past CBI Tomash Fellow Thomas Haigh and included papers by Janet Delve, on new perspectives on Jacquard looms and punched cards; CBI’s Jeffrey Yost, on semiconductor strategies of IBM and Sperry Univac in the 1960s and 1970s; Pierre Mounier, on software applications in the French Plan Calcul; and Peter Meyer, on computer use and earnings inequality.

The second, “Computing at Transnational Cross-Roads: Technology and Politics in the Cold War” was organized by past CBI Tomash Fellow Corinna Schlombs. The papers included ones by Schlombs on the Marshall Plan and productivity machines in Europe; Petri Paju and Helena Durnova on computing close to the iron curtain; and Ksenia Tatarchenko, on the Akademgorodok Computing Center and Siberian computing.

The third, “Cybernetics and Information Theory—1948 and Beyond” was organized by Frank Dittmann and Bernard Geoghegan. Seven scholars presented papers—Rudolf Seising, on cybernetics, system theory, and information theory; Lars Bluma, on early cybernetic machines; Jan Mueggenburg, on cybernetics to bionics; Ronald Kline on the disunity of cybernetics; Geoghegan on the politics of information theory; Phillip Aumann on cybernetics in Western Germany; and Dittmann on cybernetics in GDR.

The fourth, “New Research Tools for Contemporary History” was organized by CBI Director Thomas Misa. The papers included Per Lundin and Isabelle Dussage on their “Witness

Seminars and Writers' Web" to document Swedish computer use; and Misa and Joline Zepcevski on methods and tools of CBI's NSF FastLane history project (see related article in this issue).

Among the individual papers on history of computing and software at other sessions were: past CBI Tomash Fellow Nathan Ensmenger, on software maintenance as heterogeneous engineering; Honghong Tinn, on "tinkering" with imported mainframes in Cold War Taiwan; Gard Paulsen, on CCITT's programming language for telephone switches; and Elizabeth Petrick, on the writings of the Homebrew Computer Club.

The SHOT Special Interest Group for Computers, Information, and Society (SIGCIS) held its annual luncheon meeting on October 13th. The group is chaired by Thomas Haigh—who reported on the group's activities and initiatives of the past year. Next, Thomas Misa introduced a new annual SIGCIS \$1,000 publication prize for the best scholarly book on the history of computing. Details on this annual prize will be forthcoming. Jeffrey Yost spoke briefly on *IEEE Annals of the History of Computing*, and David Anderson served as auctioneer of the SIGCIS second annual book auction to raise funds for travel grants for graduate students presenting papers on computer history at SHOT. As a result of last year's auction, SIGCIS was able to award Honghong Tinn a travel award for this year's conference. For information on SIGCIS (and to join), see the group's website: <http://www.sigcis.org>

Jeffrey R. Yost

Annals Board Meets at CBI Launch of "Computing Then"

The *IEEE Annals of the History of Computing* Board met at CBI on 14 June 2008. *Annals* Editor in Chief Jeffrey Yost gave a report on submissions, other metrics, and plans for the editorial calendar. The group then engaged in a discussion of strategic planning for the journal.

Annals' October-December 2008 thematic issue, "A World of Computers," will feature articles from five talented historians on different themes in international computing: James Cortada, surveying diffusion of computing throughout the world; Eden Medina, on the history of IBM Chile; Corinna Schlombs, on IBM and Remington Rand's European strategy in the early computer industry; Timo Leimbach, on the history of German software giant SAP, and Petri Paju, on the history of computing in Finland.

Annals has plans for upcoming special issues on Asian language processing, the history of computer games, and history of database management systems. *Annals* also has a queue of exciting and important articles on a vast range of topics and themes on the history of computing. If you are not currently a subscriber to *Annals*, please follow links to subscribe at <http://www.computer.org/portal/site/annals/index.jsp> Or you can join the CBI Friends Program and CBI will send you a complimentary subscription to *Annals*. For information on "CBI Friends" see <http://www.cbi.umn.edu/about/friends.html>

Yost also introduced and led a discussion on an IEEE Computer Society-wide initiative to aggregate select print and online content from the society's 14 peer reviewed magazines on a free website/portal called "Computing Now". The initiative is designed to take advantage of

synergies of content of the 14 publications. “Computing Now” is led by IEEE volunteer Dejan Milojevic, a senior manager at HP Labs. The history portion of the “Computing Now” site is called “Computing Then,” which is led by *IEEE Annals*. “Computing Then” has select content from the most recent issue of *Annals*, podcasts of articles and department content, and other resources. “Computing Then” has just launched an exciting new feature, “Annals Through the Years,” which will feature select articles and department pieces from each of *Annals*’ 30 volumes—rolling out new content every several weeks starting with volume one. *Annals*’ board members (especially David Grier, who has led the podcast initiative, “Computing Lives”), along with IEEE Computer Society staff, have been critical to the early success of “Computing Then.” Please have a look at “Computing Then” at <http://www2.computer.org/portal/web/computingthen>

Following the meeting, the board toured the CBI archival “caverns” and the CBI exhibit “Gendered Bits” (see related article in this issue). This exhibit, examining gendered aspects of computer history, was developed by CBI Archivist Arvid Nelsen. The exhibit ran in Andersen Library atrium exhibit space from May 28th to July 23rd, and an online version of the exhibit is in the works.

Jeffrey R. Yost

In Memoriam

We are saddened to note the passing of two individuals—Joshua Lederberg and Mike Mahoney—who each had a notable impact on the history of computing and the emergence of CBI.

Michael S. Mahoney

We were shocked and deeply saddened this past July to learn that Princeton University historian of science Michael S. Mahoney had passed away. Mike, who served on the faculty for four decades at Princeton, was one of the leaders of the history of computing and software and a very dear friend to the Babbage Institute for decades. He visited CBI many times, including giving an address on the history of software at a retirement event held in honor of CBI’s founding director, Arthur Norberg, in June 2006. In June of this year, Mike participated in the *IEEE Annals of the History of Computing* Editorial Board meeting held at CBI. He long served on the *Annals* editorial board and his many contributions and insights at this meeting were indicative of the dedicated work, skilled guidance, and sound judgment that he provided to *Annals* for many years.

Early in his academic career, Mike published *The Mathematical Career of Pierre de Fermat (1601-1965)* [Princeton University Press, 1973], an elegantly written and path breaking study in the history of mathematics. Mike soon divided his research efforts between the early history of mathematics and the history of computing and software. In the latter area, he published a number of visionary historiographical articles and book chapters. As impressive as Mike’s many scholarly achievements were, they may have been exceeded by his excellence in the classroom. Mike was an extremely dedicated educator who had a profound impact on the undergraduate and graduate students fortunate enough to study with him at Princeton. He also was extremely

generous with his time in helping both young and established scholars around the world by reading and commenting upon drafts of their work. His unusually deep and broad intellect, while often challenging, made his students and colleagues grow as scholars and perfect their craft. Mike is deeply missed by many, and we at the Charles Babbage Institute send our heartfelt condolences to Mike's family.

Joshua Lederberg

Joshua Lederberg was a leading participant in the small group that created and shaped the Charles Babbage Institute. In spring of 1978, Lederberg, a distinguished molecular biologist, was the incoming president of the Rockefeller University. On April 28 he hosted the pioneering meeting of the advisory group that set the programmatic agenda for CBI. It was a remarkable assembly, chaired by Erwin Tomash and including Alfred Chandler, Robert Multhauf, Paul Armer, Jean Sammet, and other leading figures from the academy, professions and industry. Through his advice to Tomash, Lederberg shaped CBI's mission as a research and archiving center. Lederberg was a leading figure in the research world, having won the 1958 Nobel Prize for his landmark work in bacterial genetics. He served on numerous blue-ribbon advisory and professional committees. He also was a trustee for many years of the Charles Babbage Foundation. Lederberg passed away on 2 February 2008.

SAA Conference Report

At the end of August, Arvid Nelsen and Stephanie Crowe both attended their first annual conference of the Society of American Archivists, held this year in San Francisco. We presented a poster on our experimental Control Data Corporation cooperative photograph website, and we also attended some interesting and thought-provoking sessions on archival theory and practice. Some main themes running throughout the conference were the influence and use of "Web 2.0" and social networking technology in archives and cultural institutions; the discoverability of archival collections on the Web; and the acquisition, preservation, and discovery of electronic records. We also heard several excellent plenary addresses. John Dean, former White House counsel to Richard Nixon, spoke quite memorably about the importance of transparency in government and in governmental record-keeping (a role in which archivists are closely involved). We both very much enjoyed the conference this year and look forward to next year's conference in Austin, Texas.

Stephanie Horowitz Crowe

Recent Publications

Antonitsch, Peter K. et al. "Incorporating History in Secondary Education Informatics Courses." *IEEE Annals of the History of Computing* 30:3 (July-Sept. 2008): 56-63.

Boszormenyi, Laszlo. "Introduction: History of Informatics." *IEEE Annals of the History of Computing* 30:3 (July-Sept. 2008): 4-7.

Borg, Kevin L. "Following Digital Ripples." *IEEE Annals of the History of Computing* 30:2 (April-June 2008): 82-84.

Carr, Nicholas G. *The Big Switch: Rewiring the World, From Edison to Google* (New York: W. W. Norton & Co., 2008).

Delve, Janet. "A Trip Down Memory Lane? New Challenges from Other Disciplines." *IEEE Annals of the History of Computing* 30:3 (July-Sept. 2008): 90-92.

Dongarra, Jack et al. "Netlib and NA-Net: Building a Scientific Computing Community." *IEEE Annals of the History of Computing* 30:2 (April-June 2008): 30-41.

Heyck, Hunter. "Defining the Computer: Herbert Simon and the Bureaucratic Mind, Parts 1 and 2." *IEEE Annals of the History of Computing* 30:2 (April-June 2008): 42-63.

Kelty, Christopher M. *Two Bits: The Cultural Significance of Free Software* (Durham: Duke University Press, 2008).

Kidwell, Peggy Aldrich, Amy Ackerberg-Hastings, and David Lindsay Roberts. *Tools of American Mathematics Teaching, 1800-2000* (Baltimore: Johns Hopkins University Press, 2008).

Kraut, Robert, Malcolm Brynin, and Sara Kiesler, eds. *Computers, Phones, and the Internet: Domesticating Information Technology* (New York: Oxford University Press, 2006).

Mahoney, Michael S. "What Makes the History of Software Hard." *IEEE Annals of the History of Computing* 30:3 (July-Sept. 2008): 8-19.

Mindell, David A. *Digital Apollo: Human and Machine in Spaceflight* (Cambridge: MIT Press, 2008).

Mittermeir, Ronald T. "A Seminar Looking for Traces of History." *IEEE Annals of the History of Computing* 30:3 (July-Sept. 2008): 44-55.

Oberquelle, Horst, and Oskar Beckmann. "Beckmann's Study Computers Specified for Early Computer Art." *IEEE Annals of the History of Computing* 30:3 (July-Sept. 2008): 20-31.

Partridge, Craig. "Technical Development of Internet Email." *IEEE Annals of the History of Computing* 30:2 (April-June 2008): 3-27.

Ware, Willis H. *Rand and the Information Revolution: A History in Essays and Vignettes* (Santa Monica: RAND Corporation, 2008).

Wolf, Mark J. P. *The Video Game Explosion: A History from PONG to PlayStation and Beyond* (Westport, CT: Greenwood Press, 2008).

Weizenbaum, Joseph. "Social and Political Impact of the Long-term History of Computing." *IEEE Annals of the History of Computing* 30:3 (July-Sept. 2008): 40-43.

Wirth, Niklaus. "A Brief History of Software Engineering." *IEEE Annals of the History of Computing* 30:3 (July-Sept. 2008): 32-39.

Compiled by Jeffrey R. Yost

Featured Photograph

In the spirit of election season, this fall's featured photograph depicts an early attempt at reporting election returns via computerized vote totals. The Control Data Corporation made a deal with a major television station to provide computerized election results for the 1972 election. The results would be displayed to television viewers shortly after being reported by the districts. Although the television station created a set appearing to contain the computers, the real work was actually done behind the scenes in a CDC facility with operators typing results into the system as returns were called in.

For more information about the Control Data Corporation, please see <http://discover.lib.umn.edu/cgi/f/findaid/findaid-idx?c=umfa;cc=umfa;rgn=main;view=text;didno=cbi00080a> for the finding aid to the CDC Records held at CBI.

Stephanie Horowitz Crowe