

CHARLES BABBAGE INSTITUTE

CENTER FOR THE HISTORY OF INFORMATION TECHNOLOGY

NEWSLETTER

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UNIVERSITY OF MINNESOTA

Director's Desk

Once in a while, a perfect trifecta of good news happens to pass my desk. We are always pleased to follow the doings and achievements of the remarkable set of CBI-Tomash Fellows. We are happy to note, for instance, that Atsushi Akeru (Tomash Fellow 1995-1996) won this year's SIGCIS/Computer History Museum Prize for his book, *Calculating a Natural World: Scientists, Engineers, and Computers During the Rise of U.S. Cold War Research* (MIT Press) while Christophe Lécuyer (Tomash Fellow 1996-1997) won the past year's CHM prize for his book, *Making Silicon Valley: Innovation and the Growth of High Tech, 1930-1970* (MIT Press).

The perfect trifecta of good news centers on Marie Hicks, CBI-Tomash Fellow (2005-2006), who recently completed her dissertation at Duke University on "Compiling Inequalities: Office Computerization in the British Civil Service and Nationalized Industries, 1940-1979." She published a chapter in *Gender Codes*, the CBI volume recently published by IEEE Computer Society Press. All of this is good news; but there is more.

First: Marie was profiled by National Public Radio's Frank Stasio in December; you can hear the 15-minute audio clip [here](#). In her typical thoughtful style, she brought some of the results from her research on women in computing to a radio audience. That is nice enough. *Second:* The article that flagged the attention of NPR was recently published in none other than *IEEE Annals of the History of Computing*, which, as attentive readers will recall, is edited by CBI's associate director Jeffrey Yost. Jeff has been busy recruiting engaging and important scholarship, such as Marie's "Only the Clothes Changed: Women Operators in British Computing and Advertising, 1950-1970" *Annals* 32 no. 4 (2010): 5-17. Her article was the featured cover article for that number. *Third:* This spring Marie landed a tenure-track assistant professorship at Illinois Institute of Technology, in Chicago, where she will be teaching in the history of technology and history of computing and other topics. And there is one pleasant coincidence: It so happens that I taught at IIT for 18 years before coming to CBI and the University of Minnesota.

Another pleasant coincidence led to a collecting opportunity. In October John Day stopped by while giving lectures here at the University of Minnesota, and we recorded some of his

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Labor History



perspectives on the University of Illinois's ill-fated ILLIAC IV supercomputer, early networking, and the process of international standards setting. He mentioned that he had lent his copies of *ARPANET News*, a rare and valuable source, to Katie Hafner. Katie is well known as the co-author of *Where Wizards Stay up Late: The Origins of the Internet* (1996). It happened that she and I were exchanging emails about Andrew Carnegie's life and career. With a gentle prompt, and a bit of luck, she located these wandering copies and so these issues of *ARPANET News*, too, are safe and sound with CBI.

You may be wondering: How can I keep up with these notable publications? Joining the [CBI Friends](#) at the basic membership of \$100 means that we will send you the quarterly issues of *IEEE Annals of the History of Computing*, hot off the presses, so you'll be up-to-date. This year we are sending all CBI Friends at the \$250 level and above a complimentary copy of *Gender Codes: Why Women Are Leaving Computing* (IEEE Computer Society Press/Wiley, 2010). Please let us know if you'd like to join at that level—or “round up” your basic membership. Either way, we'll send you *Gender Codes* immediately. There will be additional special offers, as they say, coming your way in the fall!

Meantime, you can follow “late-breaking” news about collections and activities at the [CBI blog](#), [RSS feed](#), and our newly expanded [Facebook page](#).

Thomas J. Misa

Paul Baran (1926–2011)

We were saddened to learn of the passing of Paul Baran in late March. Paul was a long-time and generous supporter of CBI as well as numerous other ventures in computer history, more often than not anonymously. We will miss his wisdom, enthusiasm, and creativity.

I first learned of Paul’s death on the front page of the *New York Times* the morning of 28 March. It had a pocket [headline](#) “Paul Baran, Web Pioneer” that pointed to Katie Hafner’s obituary notice on an inside page. I think Paul would have appreciated Katie’s detailed and accurate appraisal more than the grand front-page headline. He regularly observed that he was frequently given undue credit for all sorts of inventions. He certainly did not claim to have invented the ‘web’ or even the ‘internet’.

As his careful biographers all point out, he should be known as the independent co-inventor, with Britain’s Donald Davies, of the methods that became known as “packet switching”—the technical underpinning of the ARPAnet, leading in time to the Internet and World Wide Web. Paul called his method “message blocks,” in which a fixed-size block of data could be flexibly routed across a communications network to reach its recipient. Davies was actually the one to coin the term “packet switching.”

The two men’s systems were similar technically but designed for different ends. Davies was designing a nation-wide network for Britain that could efficiently utilize several different paths between sender and recipient. In comparison, Baran’s system featured a much higher degree of path redundancy, aiming to confront “a most dangerous situation” in an age of nuclear ballistic missiles, which was “the lack of a survivable communications system” ([CBI oral history interview 1990](#), page



Photo courtesy of IEEE History Center

10). He published his detailed results in the 12 volumes of *On Distributed Communications* (RAND 1964).

I first met Paul in the spring of 2006, when Arthur Norberg and I went out to California to meet with some of CBI's friends and supporters. I recall being a bit apprehensive; after all, as a newcomer—historian of computing what do you say to the “inventor of the Internet”? I shouldn't have worried. Paul was all excited about the latest of his seven start-up companies. He really wanted to tell us about his company's new angle on delivering wireless television signals to people's homes. He was respectful of our historical conversation, but I remember thinking that this remarkable man—who might have rested on his many honors and achievements—instead had his mind firmly on making the future.

Thomas J. Misa

Gideon Gartner Papers to CBI

Scholars seeking to understand the history of industries that constitute the “information age” face some of the same questions that companies did at the time: How large is the industry? What are its boundaries? What are the trends shaping its evolution? Reports from well-placed consulting and advisory companies assessing an industry as well as appraising the trends were invaluable to managers, executives, and investors at the time. These reports are proving equally insightful for historians today. For example, CBI associate director Jeffrey Yost is using the Diebold Group reports to help chart the emergence of the computer services industry, sharing his early research in a paper presented at the 2011 Business History Conference ([reported in this newsletter](#)).

We are very pleased to announce Gideon Gartner's recent donation to CBI of a unique set of archival materials. He is well known throughout the information technology world as founder of the legendary Gartner Group and also, more recently, as founder of Giga Information Group. The archival collection—we have literally just opened the boxes—contains analyst reports from both these groups. Surely, this will be a major collection to be used for decades to come.

Gideon Gartner was well prepared to take a novel view of the emerging world of information technology. After collecting two degrees from MIT (mechanical engineering in 1956, and Sloan School of Management in 1960), he worked for IBM for several years watching its competition and then for the Oppenheimer Group watching IBM. With venture capital support he founded Gartner Group in 1979. There Gartner developed a distinctive research process, synthesizing data, analysis, and insights into one-page reports that were sold to his banner list of clients—IT producers, IT users, and the investment community. At Giga Information Group, founded in 1995, Gartner permitted reports to be two pages in length. On his blog gideongartner.com/blog/ he is telling the stories of his remarkable career. CBI is pleased and proud to be the archival home for these unique materials. As soon as we can, we will make them accessible to the research community.

Thomas J. Misa

McGee Named 2011-2012 Tomash Fellow

We are very pleased to announce that Andrew Meade McGee is the new Adelle and Erwin Tomash Fellow. McGee is a doctoral candidate in the Corcoran Department of History at the University of Virginia, a past recipient of UVA's President Fellowship, and a recipient of his department's 2010 graduate student teaching prize. He has recently presented papers from his dissertation research at a number of major conferences including the Organization of American Historians, Society for the History of Technology, the Business History Conference, the American Society for Environmental History, and the Policy History Conference.



A graduate of Harvard's History and Literature program, he comes to computer history from a roundabout background of Southern literature, cultural studies of New Deal America, policy-grounded research into Social Security and postwar American political development, and work examining the environmental consequences of the global sugar trade.

McGee's dissertation, "Mainframing America: Computers, Systems, and the Transformation of U.S. Policy and Society, 1940-1985," presents a political history of the computer in the United States in the four decades following World War II. Rooted at the intersection of history of electronic computing, institutional policy analysis, and the emerging field of information studies, the project details the culture of U.S. civilian government computing during the mainframe era.

Through a series of well-chosen case studies, McGee examines the introduction of electronic computers and the evolution of policies and practices associated with their use in such agencies as the Bureau of the Budget, the Social Security Administration, and the Environmental Protection Agency, and traces the role of government computing more broadly in postwar policy debates over urban redevelopment and transportation deregulation.

Having benefitted from a summer 2010 visit examining CBI holdings in government computing and other collections, McGee will soon be returning to CBI for another research trip and to present his work.

Jeffrey R. Yost

FastLane History Project Update

In 2008, we began working on the FastLane history project, which aims at documenting the history of NSF FastLane (the online grant submission tool for researchers seeking NSF funding). A major initiative in e-government, FastLane emerged from and contributed to the wider currents of information technology, including the origins of networking, the internet, LANs, and the World Wide Web. FastLane won the 1996 National Information Infrastructure - Government Award.

The history of FastLane is important and interesting in its own right, but the FastLane history project is itself a groundbreaking experiment. One goal of the FastLane project has been to invite hundreds of principal investigators, sponsored projects administrators, and NSF staff to complete online interviews. Although oral history is a great historical research tool, the cost of conducting and transcribing interviews has translated into a bias towards the “big fish” of computing history. The FastLane history project is aimed at the entire pond. As of April 2010, we have conducted over 200 traditional in-person oral histories and collected more than 250 online interviews.



The online interviews take place at a custom web site: www.fastlanehistoryproject.org. The site was designed and built by University of Minnesota doctoral candidate Joline Zepcevski. I added a few finishing touches to the site and built a custom tool to help enroll potential study participants.

We chose a “self-selecting” recruitment strategy. That is, we are canvassing a wide number of potential participants and letting them decide whether they meet our study criteria or not. Bearing that in mind, I consider our response rate of nearly 11% to be outstanding. Here are some details from the survey response data as of early April 2011.

- We have invited more than 3,200 people to participate in the study.
- Around 350 people have registered on the site.
- More than 180 principal investigators and around 20 sponsored projects administrators, and 4 NSF staff have completed interviews. (We have not yet emailed NSF staff directly to solicit interviews.)

Additionally, CBI associate director Jeffrey Yost has been criss-crossing the country conducting oral histories with principal investigators, sponsored projects administrators, and NSF staff (designers/developers, managers, and program officers). He has conducted over 160 in-person oral history interviews for the project. Interviews done by CBI's director Tom Misa round up the total to 200.

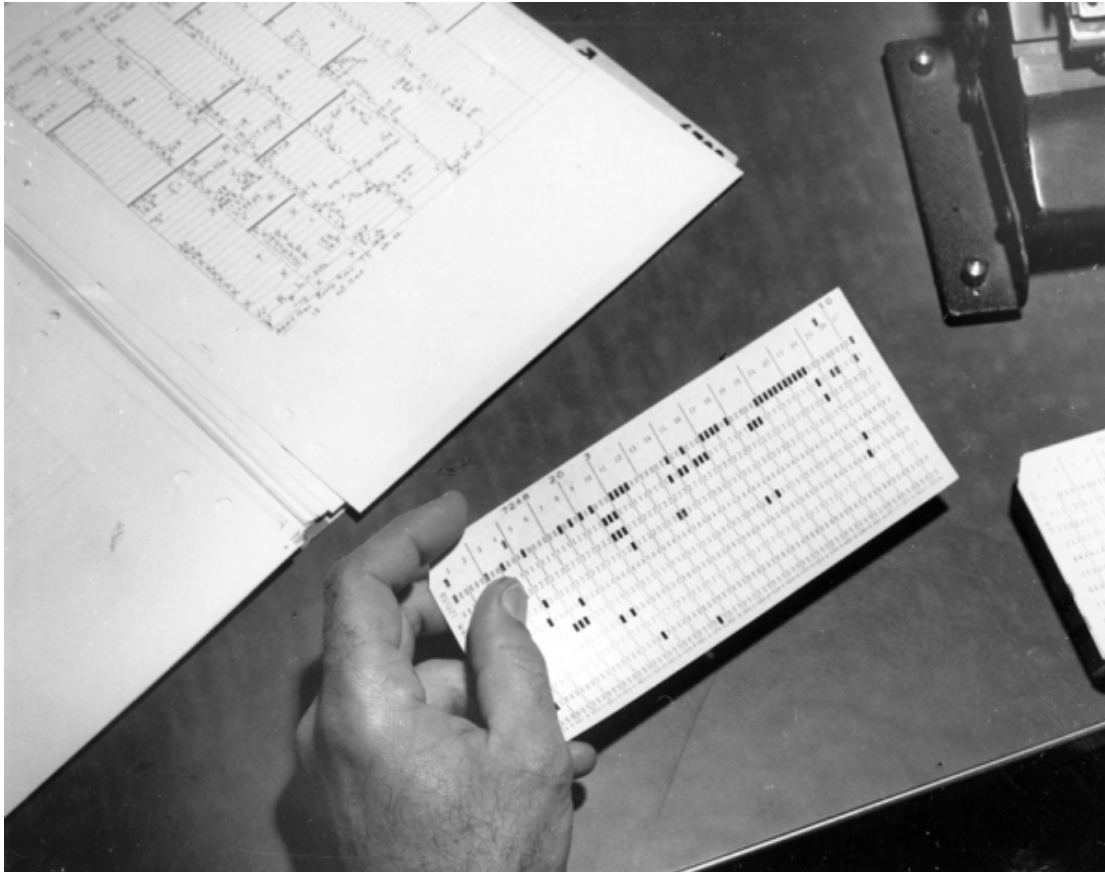
We will continue collecting in-person and online interviews, while beginning the work of analyzing the data. I am beginning work on a paper comparing the narrative qualities of the two data sources. Misa and Yost will write a history of FastLane for the NSF—the first systematic documentation of this historic cyber-infrastructure.

Josh Welsh
CBI Graduate Student Research Assistant

Keying Desire: Using the CBI Collections for the History of Sexuality

One might not think that there would be much in a history of technology archive that had anything to do with the sex researcher Alfred Kinsey. In the course of my research on his intellectual history, however, I discovered that punched-card machines were essential to the coding, processing, and analysis of his sex history interview data. I could not picture how punched-card machines worked from Kinsey's descriptions of their use alone, so I visited CBI in June 2010 to study their operation and use. CBI's Computer Product Manuals Collection, along with the papers of Wallace Eckert and Herbert Ohlman, discussed how punched-card machines functioned in American government offices and businesses and provided insight into how Kinsey used them to organize sex-related data from the late 1930s through the 1950s. Kinsey and his research team gathered responses for up to 521 questions from more than 18,000 interviewees in a roughly fifteen-year period. Punched-card machines turned out to be the ideal apparatus for looking for patterns among their large data sets.

Kinsey's rapid adoption and use of punched-card machines provides insight into the role of machines and technology in the classification, analysis, and dissemination of sexual knowledge. Some scholars have argued that mid-twentieth-century technologies of classification—particularly punched cards and punched-card sorters—became symbols of depersonalization and alienation in an ever-more mechanized world. Kinsey's utilization of punched-card machines was indeed a departure from previous forms of sex research, which focused on qualitative narrative data over quantitative statistical data. It signaled to humanist academic and psychiatric critics especially that the worst of American values—emphases on technology, quantity, money, and power—had even taken over the intimate subject of human sexuality. However, Kinsey's use of those machines would have a more complicated legacy than they and he would realize.



*Photograph by William Dellenback
Courtesy of The Kinsey Institute for Research in Sex, Gender and Reproduction*

Kinsey and his research team at the Institute for Sex Research (ISR) published two large and dense volumes based primarily on the punched-card data: *Sexual Behavior in the Human Male* (1948) and *Sexual Behavior in the Human Female* (1953). Though much of the volumes' content and findings were based on punched-card data, the cards and machines themselves have played little part in biographies of Kinsey and in histories of the ISR. My research places machines and Kinsey's patterns of data categorization throughout his life at the center of understanding his intellectual history and works.

The machine-processed data that Kinsey used increased knowledge of homosexuality and of diverse sexualities generally, and those data were instrumental in developing gay and lesbian rights movements from the late 1940s forward. Further, although machine-processed quantitative data did not become an integral part of academic sex research until much later in the twentieth century through the use of personal computers, Kinsey's enthusiastic and unapologetic use of machines signaled the beginning of their full and complex integration into the field.

Data generated from Kinsey's punched-card machines have been important in shaping modern American sexual politics, power relationships, and concepts of sexual identity. They played a critical role in developing homophile groups and broader gay rights movements in the mid- to late-twentieth century by revealing the large number of persons who engaged in homosexual behavior. "Ten percent"—the number of men whom Kinsey discovered had had exclusively same-sex sexual experiences for a period of three years—became a popular estimate for the number of homosexuals in the American population. On the other hand, cultural conservatives began to use 10 percent as their estimate of the "deviants" at large in the American public. Punched-card data may indeed have unhelpfully or unhealthily anonymized individuals in other

contexts and for other functions. In the case of Kinsey's data, however, they served to organize both homosexual groups and those groups' opponents. The publication of Kinsey's machine-produced data revealed significant and ongoing cultural investment in the heterosexual/homosexual binary on both sides of the socio-political spectrum.

After Kinsey's *Male* and *Female* volumes were published, machines, in many forms, were in sex research to stay. Qualitative and machine-gathered and -processed quantitative data would be created and analyzed in tandem. Machines had become part of human sex research for good, and studying the CBI's materials on punched-card machines and the work cultures they created led me to that conclusion.

*Donna J. Drucker, Visiting Lecturer
Department of Feminist and Gender Studies
Colorado College*

News from the Archives

I am very pleased to announce that the Carl Machover Papers (<http://purl.umn.edu/98190>) have been completely processed and are now available for researcher use. Machover and his wife Wilma donated this extensive collection to CBI in 2009. Machover was an influential pioneer in the computer graphics field. His papers document his work in computer graphics with his company, Machover Associates, as well as his work with ACM's SIGGRAPH (special interest group in computer graphics). The collection is 283 cubic feet in extent, which makes it one of CBI's top five in size. The collection's availability is a testament to the hard work of CBI's student staff members from the past year and a half –notably Valerie MacDonald, Danielle Storm, and Molly Behrens. The Carl Machover Papers are one of the premier resources in the history of computer graphics, and I encourage anyone with an interest in this field to look closely at this collection. (See related *CBI Newsletter* [article](#) on computer graphics materials at CBI.)

Finding aids for two other notable collections have also been made available. The David S. Wise Papers (<http://purl.umn.edu/95295>) add to our growing collection of ACM-related materials and explore Wise's participation in ACM leadership (particularly SIGPLAN, ACM's special interest group in programming languages). The Sperry Research Center Engineering Log Books (<http://purl.umn.edu/95294>) document day-to-day research operations of the research center and provide an unusual window into computer engineering history.

Donations that we have received over the past half year include the papers of Robert Jacobson, one of the early advocates for quantitative risk analysis in the field of computer security. Jacobson's papers add to our focus in the history of computer security, which includes the Donn Parker Papers (<http://purl.umn.edu/40845>) among others.

We have also recently received seven cubic feet of material from Gideon Gartner, the founder of the Gartner Group, a significant information technology research and advisory firm. Once available, Gartner's records will be a useful complement to the earlier Diebold Group Reports (<http://purl.umn.edu/40805>). (See related *CBI Newsletter* [article](#).)

Stephanie Crowe

Business History Conference 2011

The Business History Conference held its annual meeting in St. Louis from March 31 through April 2, 2011. CBI associate director Jeffrey Yost presented a paper entitled “Diebold and Associates, Information Technology Consulting, and the Diffusion of Knowledge on Digital Computers and Applications Programming in the 1950s.” Drawing extensively on CBI’s collection of Diebold Group Reports, the paper highlighted the important role of pioneering consulting companies to the adoption of computers for business data processing in the second half of the 1950s. The research is part of Yost’s broader research project on the history of computer services industry from the 1950s to the present.

There were several additional papers related to the history of computing and software. These included, “Circulation of Knowledge in the Second and Third Industrial Revolutions” (Hyungsub Choi, Chemical Heritage Foundation); “Canning Knowledge: Roles of Expert Systems and Knowledge-Based Engineering in Shaping the Knowledge-Based Society” (Jo Ann Oravec, University of Wisconsin, Whitewater); and “From the Phonograph to the Internet: Standards in Software/Hardware Systems, 1873-2000” (Gerben Kakker, London School of Economics).

The conference was launched with an evening plenary session focused on the conference’s theme of “knowledge.” Pamela Laird chaired the session in which Douglass North (Washington University), David Hounshell (Carnegie Mellon University), and Rakesh Kurana (Harvard Business School) broadly explored different aspects of the development, organization, transfer, and use of knowledge.

Overall, the conference’s more than 50 sessions featured over 150 papers with topics spanning continents and centuries—from printers’ networks and the news business in revolutionary America (Joseph Adelman, Johns Hopkins University) and Dutch maritime transport in the 18th century (Werner Scheltjens, University of Groningen) to real estate speculators and brokers in 19th century Paris (Alexia Yates, University of Chicago) and the Volta River Project in Ghana in the 1950s (Stephanie Decker, Aston Business School).

Exploring the Archives: Resources on Computer Graphics

The following article is the seventh 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.

In 1963, MIT doctoral student Ivan Sutherland pioneered the field of computer graphics with his development of the computer drawing program Sketchpad on a TX-2 at Lincoln Laboratory. The basis for his dissertation, Sutherland's computer graphics program used a light pen with a photoelectric tip that enabled users to draw lines and shapes on a cathode ray tube screen.

While artist Ben Laposky had created graphic images on an oscilloscope and MIT's Whirlwind had been used extensively to display real-time oscilloscope text and graphics roughly a decade earlier, Sketchpad's use of a light pen, complex algorithms, pop-up menus, constraint-based drawing, and hierarchical modeling set it apart. Furthermore, Sutherland quickly helped establish the field of computer graphics through his leadership of the Advanced Research Projects Agency (ARPA) Information Processing Techniques Office (IPTO) from 1964 to 1966—designating graphics as one of several targeted areas for ARPA's funding for computer science research—and subsequent role, along with Dave Evans, in building the University of Utah's Computer Science Department into an unparalleled center of excellence in computer graphics.

Other developments in the early 1960s—MIT graduate student Steve Russell's Spacewar computer game, Douglas Engelbart's establishment of SRI's Augmentation Research Center (ARC), and the launch of the Association for Computer Machinery (ACM) Special Interest Committee on graphics—were also pivotal moments for the future of the field. These three developments anticipated the massive computer game industry, graphical user interface tools, mechanisms ubiquitous on personal computers and the World Wide Web, and the primary professional associational home for computer graphics specialists.

The Special Interest Committee on graphics, founded in 1963, grew to become an official special interest group, SIGGRAPH, by the end of the decade. In its first years it sponsored sessions at the major computer conferences (including National Computer Conference and the Fall and Spring Joint Computer Conferences). By 1974 SIGGRAPH launched its own computer graphics conference, which grew rapidly in tandem with the special interest group—the SIG's 3,000 members in 1977 tripled to 9,000 by 1990. It was one of ACM's first SIGs and has been and remains among the most influential special interest groups in the computing field.

Sketchpad, ARPA's IPTO, SRI's ARC, Spacewar, SIGGRAPH and other key developments in graphics have not been lost to history. At the same time, given the fundamental place of computer graphics in our everyday lives—from the games we play and the movies we watch to the interface we use on all our computers and smart phones—computer graphics history is yet to be properly studied.

A small body of publicly available resources to research certain aspects of computer graphics has been available for more than a decade. Fundamentally important new collections added to the

Charles Babbage Institute in the past five years have greatly expanded research materials in this area and have established CBI as the premier repository in the world to study a diverse range of topics on the history of computer graphics.

In 2008 Carl and Wilma Machover donated an unparalleled collection of more than 280 linear feet of computer graphics materials, the Carl Machover Papers. Processing of this vast collection is now complete and it is available to researchers.

Carl Machover, whose association with CBI began more than a half decade earlier with help he provided to our NSF-sponsored “Building a Future for Software History” project, served as a radio and radar specialist during World War II. After graduating with an electrical engineering degree from Rensselaer Polytechnic Institute (RPI) in 1951 he joined Norden Laboratories Corporation and soon thereafter Skiatron Electronics and TV. This experience led him toward computer graphics display and together with several colleagues he founded RMS Associates (later renamed Information Displays, or IDI) in the early 1960s.

Information Displays created the IDI Input-Output Machine (IDIOM), a computer-aided design (CAD) platform that competed directly with the IBM 2250. Machover, an executive and marketing leader with IDI, left in 1976 to form Machover Associates, a consulting firm providing management, engineering, financial, and marketing services. Machover kept detailed organizational records of his firm, as well as collected a vast amount of research materials for his field and records from his participation in numerous professional and technical associations—including SIGGRAPH and the National Computer Graphics Association. Machover also served for a number of years as an adjunct professor at RPI and wrote several books (including *CAD/CAM Handbook* published in 1980). Both the depth and range of the materials make the Machover Papers particularly valuable for historical research.

Approximately half the contents in the collection (140 feet) is on Machover Associates. This material includes details on the enterprise itself, and also consulting reports provided for many of the clients Machover Associates served. These range from giant corporations/organizations such as Ford Motor Company, Eastman Kodak, and the U.S. Army to smaller enterprises like Gould Electronics and Mindset. Such materials can be invaluable to analyzing how organizations in a wide range of industries and sectors of the economy invested in computers to aid with industrial design, marketing, and other graphics work.

The overall collection has nine series: job files (mostly from Machover Associates), correspondence, research files, subject files, data sheets, course files, audiovisual, general files, and books. While most of the material is on Machover’s company, research, and associations, there is also a small amount of biographical records on his personal life.

The Carl Machover Papers greatly expand and complement CBI’s already strong set of materials on computer graphics from numerous different collections. Two other dedicated computer graphics CBI collections are the SIGGRAPH Conference Publications and Brunel University Department of Computer Science, International Computer Graphics Preprints. The SIGGRAPH collection contains over 10 linear feet and includes primarily printed course materials, seminar materials, and notes from the conferences. It also contains many conference programs and some catalogs. The Brunel University collection has preprints from computer graphics symposia from 1968 to 1970.

The rest of CBI's computer graphics materials are contained within broader collections. Chief among these is the Association for Computing Machinery Records, which is made up primarily of administrative records of the organization. While this sizable collection is composed primarily of materials on the central administration of the organization rather than the various ACM SIGs, there are some documents on planning and policies regarding SIGGRAPH.

Other large CBI collections that have significant computer graphics materials are Market and Product Reports and the United States National Bureau of Standards (NBS) Collection of Computer Literature. The former has some reports, newsletters, and marketing material on computer-aided design and other areas of computer graphics. The latter has an eclectic set of reports, white papers, and course material from academia, government, and industry. NBS collection material is especially noteworthy as there is considerable material from the 1960s that lends itself to studying the early history of computer graphics.

Graphics in the computer-education initiative PLATO can be studied in CBI's University of Illinois at Urbana-Champaign, Computer-Based Education Research Laboratory PLATO Reports, PLATO Documents, and CERL Progress Reports, as well as in the Control Data Corporation Records and the William C. Norris Executive Papers.

CBI collections with small holdings of computer graphics materials (books, serials, reports, product literature, and other documents) include: James W. Cortada Papers, Curt A. Monash Papers, Information Processing Glossaries, Control Data Corporation Records, The United States Government Computing Collection, and the Michael S. Mahoney Papers.

CBI also has conducted a number of oral history interviews detailing the technical, scientific, and industrial/organizational history of computer graphics. Chief among these are oral histories with Carl Machover, Ivan Sutherland, Charles Csuri, Arthur Spielberg, Scott Gaff, and Laszlo Belady.

Jeffrey R. Yost

2011 Arthur L. Norberg Travel Fund Recipients

The Charles Babbage Institute is pleased to announce we are awarding travel grants to Hansen Hsu and Rachel Lee to conduct research at CBI during this calendar year.

Hansen Hsu, a doctoral candidate at Cornell University in Science and Technology Studies, is visiting to conduct research for his dissertation on the history of the NeXT/Apple Cocoa software development community. Specifically he plans to use the Michael S. Mahoney Papers, the Association for Computing Machinery Records, the Charles W. Bachman Papers, and other collections to provide background and foundational analysis on object-oriented programming to contextualize the work of the Cocoa community.

Rachel Lee, a doctoral candidate in English at the University of Rochester, will be travelling to CBI to conduct research in support of her dissertation on romantic poetry, media history, and the digital humanities. One of her principal case studies is on the William Blake Archive, a project of University of Virginia's Institute for Advanced Technology in the Humanities that pioneered techniques for electronic scholarship, site construction, and digital reproduction. The Charles Babbage Institute has the William Blake Archive Project Records, which contains critical primary documents to her case study.

The Arthur L. Norberg Travel Grant competition takes place at the start of each year (January 15 deadline). This travel grant fund was created in honor of the founding director of the Charles Babbage Institute. It is made possible by the generosity of donors listed below.

Arthur L. Norberg Travel Fund Contributors

William Aspray

Susan T. Jones

Charles Bachman

Sally G. Kohlstedt

Paul Baran

Mark A. Largent

Martin Campbell-Kelly

Thomas J. Misa

Judith & John Diffenbaugh

Robert M. Price

Ronald Frazzini

Linda C. Smith

Bruce Gilchrist

Roger H. Stuewer

Martin A. Goetz

Earl E. Swartzlander

Thomas P. Hughes

Erwin & Adelle Tomash

John Impagliazzo

William Wulf & Anita Jones

George T. Jacobi

Jeffrey R. Yost

“The Information”

CBI director Tom Misa published a review in *Nature* (17 March 2011) of *The Information: A History, a Theory, a Flood* (Pantheon, 2011), by noted science author James Gleick. You can find the review on the magazine’s website <<http://www.nature.com/nature/journal/v471/n7338/full/471300a.html>> or linked to the “Spotlight” section on the [CBI website](#).



TECHNOLOGY

The medium is the message

Thomas J. Misa enjoys a history of communication tools, from talking drums to Twitter.

Information is the paradigm of our time. Economies that once manufactured goods now create value by processing information. Global flows of money, ideas and news determine which countries engage with global society and which are left silently on the sidelines. A skein of pervasive mobile computing keeps us connected — instantly, continuously, incessantly. James Gleick’s latest book, *The Information*, examines the genesis of the information society and the roots and consequences of information theory.

Gleick is no stranger to demanding scientific topics. His blockbuster *Chaos* (Penguin, 1987) popularized Edward Lorenz’s mathematics of complexity. He is also the biographer of physicists Richard Feynman and Isaac Newton. In *The Information*, he highlights the great surge of classifying and calculating often labelled as the industrial and scientific revolutions, and he profiles leading theorists, notably US mathematician Claude Shannon.

Gleick acknowledges that the concept of information and its impacts are difficult to grasp, yet explains our fascination with seeing information as the driver of just about everything.

Rather than telegraphs or telephones, Gleick begins with ‘talking’ African drums. Because African languages had hundreds of sounds, it seemed impossible to European observers that complex messages could be conveyed using drums that made only two sounds, pitched high and low. Yet for centuries, almost all African people could understand the messages that were broadcast by skilled drummers.



The Information: A History, A Theory, A Flood
JAMES GLEICK
Pantheon/Fourth Estate: 2011, 644 pp.
\$29.95/£25

After decades of European puzzlement, John Carrington’s 1949 book *The Talking Drums of Africa* revealed all. There was no telegraph-like Morse code within drumming. African languages relied only partly on unitary sounds or ‘phonemes’ and more fundamentally on their intonation. Simply altering their tones could transform the phonemes for ‘he watched the riverbank’ into ‘he boiled his mother-in-law’. With drum tones expressing the rising and falling pitches of African speech, drummers could accurately convey a complex message. And anyone whose ear was attuned could understand it. Using this accessible analogy, Gleick deftly introduces the concepts of information channels, intentional redundancy of messages and the importance of error correction.

Gleick’s more technical treatment of Shannon and information theory is a recurring thread of the crucial middle chapters. He serves up enlightening side views

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Compiled by Jeffrey R. Yost

Featured Photographs



*Student Paper Competition Award Presentation, 1978
From Association for Computing Machinery Records (CBI 205)*

One of the main missions of the Association for Computing Machinery (ACM) is educational outreach. ACM has student chapters as well as events and initiatives geared towards students. Here, ACM President Daniel McCracken (see <http://purl.umn.edu/41426> for the finding aid to his papers at CBI) presents a student paper award to J. W. Wendorf in the late 1970s.



*International Collegiate Programming Contest, 1993
From Association for Computing Machinery Records (CBI 205)*

Also included in ACM's student initiatives has been its sponsorship of an International Collegiate Programming Contest (or International Scholastic Programming Contest, depending on the year). A scene from the 1993 contest can be seen here.

Stephanie Crowe