

# **CHARLES BABBAGE INSTITUTE**

**CENTER FOR THE HISTORY OF INFORMATION TECHNOLOGY**

**NEWSLETTER**

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**The Charles Babbage Institute for the History of Information Technology is sponsored by the University of Minnesota and the information technology community.**

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# Charles Babbage Institute Annual Report

*July 1, 2001 to June 30, 2002*

During the year ending June 30<sup>th</sup> 2002, CBI staff focused most of their efforts on completing historical and archival research projects begun over the past three years as well as pursuing new collections. Institute staff published a significant amount of scholarship, including two books, several articles and book chapters. The NSF-sponsored Software History Project entered its third year in September 2001, and by the end of the fiscal year, we were beginning to design the concluding phase of the project, which soon enters a 12-month, no-cost extension period. Our effort to deliver more research material online continued at a fast pace this year. A searchable, database-driven, Web resource of detailed descriptive information and full-text transcripts from CBI's Oral History Collection went online in October 2001, along with a software program to trace downloads of these resources. Several hundred oral histories were downloaded from the CBI Web site by an average of 45 different users per month.

CBI accomplished each of these results as part of ongoing historical research and archives programs. Besides pursuing these programs, CBI staff attended to over 365 requests for information from off-site users. In addition, a number of researchers visited the Institute, with innumerable service requests during their extended stays.

## **Research**

Staff historians made a number of contributions to the historical and historiographical literature of calculating, computing, and networking this past year. In the fall of 2002, CBI Associate Director Jeffrey Yost's bibliography on scientific computing will appear from Greenwood Press. Yost prepared this volume as a co-Principal Investigator for CBI's NSF-sponsored study of the "Computer as a Scientific Instrument" (NSF SBR 961981). This bibliographic book contains an interpretative essay and more than 1,000 annotated entries for the period 1945 to 1975. It is the first reference work to focus on the history of computing in the physical, cognitive, biological, and medical sciences and it will be an important tool for research in these areas. Yost also wrote an overview on the history and historiography of computers and the Internet that will appear in Carroll Pursell's new volume on the social and cultural history of American technology that is being published by Blackwell Publishers. CBI Director Arthur Norberg co-edited (with Ulf Hashagen and Reinhard Keil Slawik) a volume entitled, *History of Computing: Software Issues*. This book, which maps historical study needs in software, is the revised proceedings of the International Conference on the History of Computing, ICHC 2000 (April 5-7, 2000) that was co-sponsored by CBI. Norberg also wrote an essay on table making and calculation efforts by 18<sup>th</sup> and 19<sup>th</sup> century astronomers for a conference at Oxford University in fall 2001. He subsequently revised the essay for publication in a proceedings volume of the conference to appear from Oxford University Press in 2003.

Software History Project Manager Philip Frana researched and wrote a history of Internet Gopher developments at the University of Minnesota, which will be published by *IEEE Annals of the History of Computing*. CBI Archivist Elisabeth Kaplan's research article "Many Paths to Partial Truths: Archives, Anthropology, and the Power of Representation" will appear soon in *Archival Science: The International Journal on Recorded Information*.

### **Software History Project**

CBI staff made considerable progress on the NSF-sponsored "Building a Future for Software History" over the past twelve months (see related article: "A Brief Report on the Software History Project"). The Institute completed extensive work in preparation for *Iterations: An Interdisciplinary Journal of Software History*. This electronic journal will be launched later this month and features articles on a range of themes and approaches to software's past (see related article: "Launching Iterations"). In addition, the journal provides reviews of electronic resources on software history and a forum for readers' perspectives. The software history dictionary continued to advance, as many new entries were drafted. Last, but not least, CBI historians conducted more than a dozen oral histories with pioneers from the software industry and academe. These included founders of path-breaking software firms, Turing Award winners, a Nobel Laureate and many other highly distinguished individuals. CBI will complete this NSF-sponsored project by the end of next summer.

### **CBI Web Site Additions**

CBI has had a digital presence for over a decade. As we noted last year when our new Web site was unveiled, Web site expansion and maintenance has become a major activity at the Institute. The archival staff continued its upgrading of CBI's finding aids. This year we encoded 61 finding aids in the new Encoded Archival Description (EAD) format (XML based). Seventy-two more are in process of conversion, which will complete the project. All new finding aids developed this year are in this format. The new format is a stable storage format, enhances searching, and allows interchange of data across institutions. EAD is platform independent, making future portability accessible.

A searchable, database-driven Web resource of detailed descriptive information and full-text transcripts for 172 research-grade interviews from CBI's collection went online last fall. This database uses proven technology to deliver content of demonstrated value to identifiable audiences and employs a delivery mechanism that is easy to use and meets accepted and emerging standards for description and for long-term preservation. This program allows CBI to keep records of users and downloads of oral histories as implied in the citation of statistics above.

Many new additions were made to the software bibliography on the CBI Web site, a source that now contains nearly 1,800 citations. Additionally PDF files of all past *CBI Newsletters* were mounted on the site this year.

## **Archives Collection Activities**

CBI's Collection development activity continued to acquire quality collections that complement present CBI holdings, and expand opportunities for research. CBI added approximately 30 new accessions in FY2001. Among these collections are:

John Day Papers (development of Internet protocol)  
MRI Systems Records (database management)  
Blake Archive Project Records (digital archiving, web tools)  
Donn Parker Papers (information security)  
Robert Head Papers (ERMA, SABRE, government information systems)  
Lamb & Company Records (graphics)  
General Kinetics Records (spinoff of ERA/Remington Rand)  
Gertrude Blanch Papers (Math Tables Project, personal papers)  
William C. Norris Papers (Control Data Corporation, Norris Institute)  
Willis Ware Papers (significant additions)  
Silicon Alley (NY) Reporter

More collections became available for research and interpretation as processing of previously received collections continued. Among the collections processed and now available for research are:

Applied Data Research Records  
Martin L. Goetz Papers  
Gertrude Blanch Papers  
Ada Programming Language Materials  
Auerbach Associates Reports  
ADAPSO Records  
ACM-SIGGRAPH Records  
Data Processing Digest  
Digital Equipment Computer Users Society (DECUS), proceedings and publications

## **Archives and Historical Research Workshops**

Several research groups related to CBI activities called special meetings this year to study issues connected to the new online world of archival availability. Elisabeth Kaplan participated in two meetings of great significance to our as well as national archival programs. The Council on Library and Information Resources and the Alfred P. Sloan Foundation sponsored a meeting "Ensuring Long-Term Access to Web-Based Documents," in Washington, DC in April 2002. Among the thirty-five invited participants were scholars, librarians, publishers, and technologists who have worked on various aspects of digital archiving. The purpose of the meeting was to address long term use and preservation problems relating to a variety of complex Web-based documents that are now being created for use by researchers and teachers, most with funding from the NSF and the Sloan Foundation.

Kaplan also participated in the NSF's (National Science, Technology, Engineering, and Mathematics Education Digital Library program) meeting in May 2002 to review grant proposals for digital libraries projects. Building on work supported under the multi-agency Digital Libraries Initiative, this program aims to establish a national digital library that will constitute an online network of learning environments and resources for science, technology, engineering, and mathematics (STEM) education at all levels."

Jeffrey Yost and Software History Project Manager Philip Frana participated in the National Science Foundation-Knowledge and Distributed Intelligence (KDI) Principal Investigator Workshop in New Orleans this past April. This important workshop was organized to exchange information on interdisciplinary scientific research, including CBI's NSF/KDI-sponsored project "Building a Future for Software History." The purpose of the meeting was three-fold: to identify goals and establish appropriate metrics for interdisciplinary scientific research; to report on individual projects and assess challenges in scientific collaboration; and to discuss future directions for research across disciplines and possibilities for fostering new initiatives. In small group discussions Yost and Frana related how CBI's project has built new resources for studying the history of software and captured opportunities for meeting the needs of wide constituencies of researchers.

### **The Adelle and Erwin Tomash Fellowship**

Rachel Yould completed her very distinguished tenure as the 2001-2002 Tomash Fellow. (See related article). She presented her comparative research on the history and policy of Internet functionality and applications in Japan and the United States at many prestigious forums over the course of last academic year. She was a featured speaker at the Harvard Program for Asian and International Relations' 2001 Conference in Singapore and gave a talk to academic and industry specialists at the Royal Institute of International Affairs in London as part of the Asia-Pacific Technology Network seminar series.

The Charles Babbage Institute named Gualtiero Piccinini as the 2002-2003 Adelle and Erwin Tomash Fellow. Piccinini, born in Milan, Italy, graduated from the University of Turin in 1993 with majors in philosophy and cognitive science. He is a doctoral candidate in the history and philosophy of science at the University of Pittsburgh. Piccinini's dissertation project is focused on the history of "computationalism," or the idea that the brain is a computer. His research concentrates on the work and ideas of Alan Turing, John von Neumann, Warren McCulloch, Norbert Wiener, and others who led the development of a new methodology for studying cognition based on the construction of mechanical models inspired by the modern computer.

### **CBI Staff Publications**

"CBI: Providing Leadership in the Preservation and Interpretation of Information Technology History," (Minneapolis, MN: Charles Babbage Institute, 2002). [Brochure on CBI's historical research and archives programs].

4 *CBI Newsletters* (Vol. 22, No. 4; Vol. 23, Nos. 1, 2, and 3) All online.

### **Publications by Individual CBI Staff Members**

#### *Books:*

Reinhard Keil-Slawik, Ulf Hashagen, Arthur L. Norberg, editors, *History of Computing: Software Issues*, (Munich: Springer-Verlag, 2002).

Jeffrey R. Yost. *A Bibliographic Guide to Resources in Scientific Computing, 1945-1975*. (Westport, CT: Greenwood Press, 2002). [Publication date: 30 October 2002]

#### *Articles:*

Philip L. Frana, "Hunting the Wumpus: Internet Gopher and the Information Revolution," *IEEE Annals of the History of Computing*, forthcoming.

Philip L. Frana, "A Well Intentioned Query and the Halloween Problem," *IEEE Annals of the History of Computing*, 24(April-June 2002): 86-88.

Arthur L. Norberg, "The Modern Computer Business," Chapter 13 in A. Akera and F. Nebeker, editors, *From 0 to 1: An Authoritative History of Modern Computing*, (Oxford: Oxford University Press, 2001)

Jeffrey R. Yost. "Computers and the Internet: Braiding Irony, Paradox, and Possibility." In Carroll W. Pursell, edited, *American Technology. Blackwell Readers in American Social and Cultural History*. (Oxford: Blackwell Publishers, 2003).

Jeffrey R. Yost. "Seymour Cray" *American National Biography, Supplement* (New York: Oxford University Press, 2002).

### **Presentations**

Philip L. Frana, "Ensuring E-Quality for E-Scholarship: the Charles Babbage Institute's Software History Project," annual meeting of the American Historical Association, San Francisco, CA, January 2002.

Elisabeth Kaplan and Carrie Seib, "Using IT to promote the history of IT: digital initiatives at the Charles Babbage Institute," E-Text Extravaganza, a national forum hosted by the University Libraries, Minneapolis, MN, October 2001.

Arthur L. Norberg, "Table Making and the Astronomical Community from the 18<sup>th</sup> to the 20<sup>th</sup> Centuries," International Conference on Mathematical Tables, Kellogg College, Oxford University, Oxford, England, September 2001.

Carrie Seib, "Archivists as Mentors," Midwest Archives Conference, Indianapolis, Indiana, October 2001.

Jeffrey R. Yost, "Twenty-five years of a public-private partnership: the CBI program," CBF Symposium, San Jose, CA, May 2002.

Jeffrey R. Yost, "The CBI Program," ADAPSO Reunion Meeting, Washington, DC, May 2002.

## **A Brief Progress Report on the Software History Project**

*By Jeffrey R. Yost*

The Charles Babbage Institute has now entered the final year of its National Science Foundation (NSF) sponsored Software History Project, "Building a Future for Software History." (NSF 9979981) As part of this project, CBI is launching *Iterations: An Interdisciplinary Journal of Software History* later this month (see related article). This peer-reviewed scholarly journal contains articles on software development and applications from long-time leaders in the area of information technology history, James Cortada and Paul Ceruzzi, as well as exciting work from more recent entrants into this field, including Julian Kilker, Juliet Burba, and Philip Frana. The journal also contains reviews of individual resources of software history available on the World Wide Web.

The work on the online historical dictionary of software technologies and techniques continues under a revised plan. The original plan, to have individuals from the software community write draft entries, has proceeded too slowly to produce a useful reference tool by the end of this particular project. A new model has been established where most of the dictionary entries are written by CBI project staff. Volunteers from the software community continue to assist with the important task of authoritatively reviewing the entries. The in-house research has focused on important areas of software history that have been particularly neglected in the past, including: databases, graphics, scientific applications, and business applications. Through extensive research and the review process, a much smaller, but ultimately very useful, online reference tool will result.

Following upon CBI's long successful work on oral history, many pioneers in software development and the software industry have been interviewed. In addition to documenting important research in academic settings, the interviews provide information and perspective on the origin and early development of management and technology in the software industry. More than 75 percent of the designated 32 oral histories for this project have been conducted. The remainder will be recorded in the following twelve months. Most interviews have been transcribed and edited and are now available on the CBI Web site at <http://www.cbi.umn.edu/oh/>

Seventeen oral history interviews were conducted over the past fiscal year as part of “Building a Future for Software History.” Individuals interviewed include:

Don Chamberlin  
Gary Durbin  
Edsger Dijkstra  
Martin Goetz  
Jim Gray  
Glenn Henry  
Ernest Keet  
Donald Knuth  
Kenneth Kolence  
Larry Lamb  
Raymond Lorie  
Mark McCahill  
William McGee  
Carl Machover  
Herb Pelnar  
Ben Persons  
Gio Wiederhold

## Launching Iterations

The Charles Babbage Institute will be launching a new journal, *Iterations*, on its Web site in September 2002. The journal is at <http://www.cbi.umn.edu/iterations>

*Iterations: An Interdisciplinary Journal of Software History* is being published by CBI to provide an outlet for scholarship and lend momentum to this emerging field. From the technical, business, and institutional to the social, cultural, and intellectual history of software, *Iterations* seeks to add to both the breadth and depth to this subdiscipline. This electronic journal will also aim to provide a lively forum for researchers, readers, and other interested individuals to share knowledge and perspectives. The launch of *Iterations* is partially sponsored by the National Science Foundation, as a component of CBI’s “Building a Future for Software” project (NSF 9979981). By disseminating scholarship and providing a mechanism for ongoing dialogue, *Iterations* complements CBI’s other two software history project components: developing an online historical dictionary of software technologies and techniques; and conducting, transcribing, and making available oral history interviews with pioneers in software development and the software industry. These latter two initiatives seek to offer starting points, fill in some of the many gaps in the available documentary record, and expand interest in conducting scholarly research in software history.

The content of *Iterations* at its launch will give a sense of the range of important and understudied areas of software history the journal wishes to address. The journal will contain scholarly articles by IBM Global Services and CBF Chair James Cortada, the Smithsonian's Paul Ceruzzi, and University of Nevada, Las Vegas' Julian Kilker. It will also include an extensive review article by the CBI's Juliet Burba and Philip Frana.

Cortada's article on computer and software applications in the petroleum industry provides both an historical analysis of software use within a particular trade, as well as an historiographical model of understanding how software helps shapes possibilities and practices in software's past within many different industries.

Ceruzzi offers an important technical, political, business, and legal analysis of perhaps the most defining contemporary issue in the software field: the Department of Justice's antitrust case against Microsoft. He details how Microsoft simultaneously faces charges of anti-competitive practices for bundling Internet application software to their operating systems and a competitive threat from Linux and supporters of open source.

Kilker's article on the history of email gives a rich analysis of social and cultural factors influencing the development and use of this networking application. More specifically, he demonstrates how technical interoperation and social collaboration influenced the evolution of the technology and resulted in flexible standards for email.

Burba and Frana provide an informed survey of the voluminous types and content of Web material on software history. They categorize these materials and offer insights into their potential use by historians and other scholars. *Iterations* will also include individual Web site reviews on software history by scholars in the field.

*Iterations* will publish continuously and will inform "subscribers" of new scholarly articles as they are published. *Iterations* is free of charge and individuals can be added to the email list for notification of future articles by sending an email message to [cbi@tc.umn.edu](mailto:cbi@tc.umn.edu).

*Jeffrey R. Yost*

## News from the Archives

### **Collections received**

Donald Daykin, who worked for IBM from 1951 to 1991, has donated his library of early computer publications, along with a full run of the *IBM Systems Journal* and other serial publications. Of particular interest are several items relating to Russian and other international computing.

The Association of Information Technology Professionals (ITAA), formerly the Data Processing Management Association (DPMA) has donated serial publications that fill in

gaps in our DPMA collection. Also included in the donation are a set of photographs from the 1963 National Machine Accountants Association convention, and a dissertation on the history of the DPMA.

An oral history interview with Harry M. Markowitz, conducted by Jeffrey Yost in March 2002, in San Diego, California is now available in full text on the CBI Web site at <http://www.cbi.umn.edu/oh/>

We thank these and other donors who continue to offer historical materials to our collection. When a donation duplicates or is not appropriate for the CBI archives, we will work with donors to find a suitable home for their materials.

The following collections were processed this summer and are now available for research.

Robert V. Head Papers, 1956-1998 (CBI 170)  
<http://www.cbi.umn.edu/collections/inv/cbi00170.html>

The William Blake Archive Project Records, 1995-2002 (CBI 174)  
<http://www.cbi.umn.edu/collections/inv/cbi00174.html>

Minnesota Joint Computer Conference (MJCC) Records, 1978-1994 (CBI 173)  
<http://www.cbi.umn.edu/collections/inv/cbi00173.html>

Finding aids for several of our existing collections were updated as well. These include: U.S. Government Computing Collection, ca. 1945-1983 (CBI 63)  
<http://www.cbi.umn.edu/collections/inv/govt.htm>

American Federation of Information Processing Societies (AFIPS) Records, 1960-1990 (CBI 44)  
<http://www.cbi.umn.edu/collections/inv/cbi00044.html>

Alex McKenzie Collection of Computer Networking Development Records, 1969-1990 (CBI 123)  
<http://www.cbi.umn.edu/collections/inv/cbi00123.html>

Uncataloged Serials, 1948 – (ongoing) (CBI 152)  
<http://www.cbi.umn.edu/collections/inv/cbi00152.html>

### **Staff news**

In June 2002, CBI Assistant Archivist Carrie Seib received a University of Minnesota Libraries staff award for her outstanding work on the CBI oral history database project. The Libraries recognizes exceptional contributions by four staff members during an annual awards ceremony. Carrie's nomination noted her exceptional combination of technology, management, and reference skills, as well as her ability to collaborate effectively with the Libraries Web Team and her seemingly endless enthusiasm and good

humor in seeing this challenging project to its completion. For more information about the project, see *CBI Newsletter* Fall 2001, "CBI Oral Histories Online.

Project archivist Maria Plonski joined the CBI staff in August 2002. Maria is a Minnesota native who has returned to the Twin Cities after receiving her MLIS with a specialization in Archives Management at Simmons College in Boston. She last worked in special collections at the Countway Library of the Harvard Medical School and will work at CBI part-time while completing her thesis for a graduate history degree.

CBI archivist Beth Kaplan will be on leave for the month of September, 2002, and then again during January and February, 2003. In her absence, Carrie Seib will serve as acting archivist. Please direct inquiries about research, donations, or other archives matters to Carrie at [caseib@tc.umn.edu](mailto:caseib@tc.umn.edu)

*Elisabeth Kaplan*

## **CBI Web Site**

### **CBI Web Site Recognized**

The Internet Scout Project selected the CBI Web site for inclusion in the July 5, 2002 issue of its National Science Digital Library Report for Math, Engineering, and Technology. The report is a biweekly current awareness publication that highlights high-quality new and newly discovered Internet resources in these areas. Selection criteria are: quality of content, authority of the information source, presentation, maintenance of information, and availability. Published continuously since 1994, the Scout Report is one of the Internet's oldest and most respected publications. The Internet Scout Project is located in the Department of Computer Sciences at the University of Wisconsin-Madison, and is funded by a grant from the National Science Foundation.

Internet Scout Project

<http://scout.cs.wisc.edu/>

Also in July, the CBI Web site was selected as the "In Focus" feature on the UNESCO Archives Portal. "In Focus" is a selection of international archives-related sites. Selections for 2002 have included the Kenya National Archives; Hubei Archive Network Information Center; the Olympic Museum Historical Archives; and the archives of the UN High Commissioner for Refugees. The UNESCO Archives Portal is a project of UNESCO's Information Society Division. The portal "gives access to websites of archival institutions around the world" and serves as a "gateway to resources related to records and archives management and to international co-operation in this area."

UNESCO Archives Portal

[http://www.unesco.org/webworld/portal\\_archives/pages/](http://www.unesco.org/webworld/portal_archives/pages/)

### **Web Site Accessibility**

CBI archives staff recently conducted a review of the CBI Web site to assess compliance with new University of Minnesota Web page accessibility standards. The review was

part of an on-going, University-wide effort to ensure equal access to all University of Minnesota Web pages, information, and services for the widest possible audience—including users of old, adaptive, alternate, or emerging technologies. The effort began in March 2002 when the University adopted a new Accessibility of Information Technology policy. The University's standards for Web page design, which are stricter than the W3C's guidelines on the issue, are being implemented in phases.

CBI archives staff reviewed nearly thirty standards for accessible Web pages design. The standards include design consistency; avoiding the use of frames, blinking page elements, and backgrounds or wallpaper that may interfere with the readability of text; providing alternative text for all graphical page elements; providing e-mail addresses in mailto links; and avoiding the use of server-side image maps. CBI is happy to report nearly 100 percent compliance with the University standards.

University of Minnesota Accessibility of Information Technology Policy

[http://www.unesco.org/webworld/portal\\_archives/pages/](http://www.unesco.org/webworld/portal_archives/pages/)

University of Minnesota Web Accessibility Standards

<http://cap.umn.edu/ait/Web/index.html>

Carrie Seib and Elisabeth Kaplan

## **Rachel Yould's Fellowship Year**

This July marks the end of Rachel Yould's tenure as the 2001-2002 Adelle and Erwin Tomash Fellow. Rachel began her fellowship year with a visit to the Charles Babbage Institute during which she discussed her work with CBI historians and archivists and made extensive use of a number of the Institute's collections. She found the CBI materials she accessed to be invaluable to her dissertation and related research. During the course of the year, Rachel presented her research findings widely. She was a featured speaker at the Harvard Program for Asian and International Relations' 2001 Conference in Singapore and spoke to academic and industry specialists at the Royal Institute of International Affairs in London as a speaker for the Asia-Pacific Technology Network seminar series. Rachel was also selected to serve as one of six appointed Japan technology experts for a study on the ways in which Internet functionality and the application of Internet technologies differs in Japan relative to North American and European models. Findings from this study culminated in the Philips Design Research Report titled "Philips Components Image and Identity: Expert Interviews" (Commissioned by Matt Madeiros, Philips Components, ©2001 Koninklijke Philips Electronics N.V.). Rachel made great strides in her research during the course of her fellowship year and is in the process of refining her dissertation for final submission. She is currently participating in an eight-week writing collegium hosted by the Social Science Research Council's Program on Information Technology, International Cooperation and Global Security and completing an article for CBI's new online journal, *Iterations*. CBI congratulates Rachel on her many accomplishments this past year.

## Edsger Wybe Dijkstra, 1930-2002

Edsger Wybe Dijkstra, who made fundamental contributions to the logical underpinnings of programming and operating systems, died at home in Nuenen, The Netherlands, on August 6, following a long battle with cancer. Dijkstra was born in Rotterdam in 1930, and graduated with a Ph.D. in mathematics and physics in 1959. Between 1952 and 1962 he worked in the Mathematical Centre in Amsterdam as a programmer. He taught mathematics at Eindhoven University between 1962 and 1984, and then moved to Austin, where he held the Schlumberger Centennial Chair in Computer Sciences at the University of Texas until retiring in 1999. Dijkstra was awarded the Turing Award in 1972.

Dijkstra championed the use of recursion in the development of the international algebraic language ALGOL 60. Recursion, often used in functional languages, occurs when an instruction or set of instructions calls itself repeatedly to solve a defined problem. Recursion rarely results in a net reduction in program size, but does create highly structured programs that are arguably easier to design, compile, test, and debug. Recursive program definitions may be contrasted with iterative algorithms, used in procedural languages, where a set of instructions to be repeated is expressed with loops. Dijkstra vigorously assailed iterative or repetition clauses in a famous essay entitled “Go To Statement Considered Harmful,” published in *Communications of the ACM* in 1968.

Dijkstra’s shortest-path algorithm (or simply, “Dijkstra’s algorithm”), published in 1959, is a notable early example of the use of recursion in programming. The genesis of this algorithm stemmed from Dijkstra’s need to define a problem and develop a program that would not overly tax the university’s ARMAC [Automatische Rekenmachine Mathematisch Centrum] computer, but also connect with the non-computing people attending a “festive” open house for an International Mathematical Conference. The ARMAC’s predecessor, the ARRA [Automatische Relais Rekenmachine Amsterdam] computer had been notoriously unreliable and, as Dijkstra described it later, “the only safe demonstration we dared to give was the generation of random numbers.”

Dijkstra hoped to show off a more sophisticated program on the ARMAC, and has often recounted how a solution came to him: “One morning I was shopping in Amsterdam with my young fiancée. Tired, we sat down on the café terrace to drink a cup of coffee and I was just thinking about whether I could [find the optimal path between points on a map], and then I invented the algorithm...which I designed in about twenty minutes or so.” The resulting ARMAC demonstration program calculated the shortest rail route between sixty-four cities in The Netherlands.

Dijkstra’s shortest-path algorithm is still central to calculating the optimal routes between addresses on online maps, including the directions offered by MapBlast and MapQuest

on the Web. The algorithm is also of considerable economic value in transportation management planning.

I had the pleasure of conducting an oral history interview with Dijkstra in August 2001. The transcript of this interview is now available in the Charles Babbage Institute oral history collection (see <http://www.cbi.umn.edu/oh/display.phtml?id=320>). Writings collected from his days as a Research Fellow for the Burroughs Corporation between 1973 and 1984 are also available to researchers from CBI. A finding aid to these papers may be found at <http://www.cbi.umn.edu/collections/inv/burros/dijkstra.htm>.

*Philip L. Frana*

## **Upcoming Events in the History of Information Technology**

### **Second Conference on the History and Heritage of Scientific and Technical Information Systems**

**November 16-17, 2002**

***Philadelphia, PA***

The Chemical Heritage Foundation (CHF) and the American Society for Information Science & Technology (ASIS&T) announce the Second Conference on the History and Heritage of Scientific and Technical Information Systems, to be held in Philadelphia at CHF(315 Chestnut Street), 16-17 November 2002, immediately preceding ASIS&T's Annual Meeting in that city.

Emphasis for this conference will be on scientific and technical information systems in the period from the Second World War up through the early 1990s. Thirty-five historians of science and technology, information scientists and scientists in other fields will be delivering papers on a wide range of topics: informatics in chemistry, biology and medicine; information developments in multi-national, industrial and military settings; biographical studies of pioneering individuals; and the transformation of information systems and formats in the twentieth century.

Information science pioneers from the United States and abroad will be special guests at the conference and are among those making presentations.

For draft program and abstracts, see

[www.chemheritage.org/HistoricalServices/2002HHSTIS2.htm](http://www.chemheritage.org/HistoricalServices/2002HHSTIS2.htm)

To register and for information about housing, contact Todd Waters, External Relations Assistant, at [toddw@chemheritage.org](mailto:toddw@chemheritage.org) or (215) 925-2222, ext. 301. Please indicate to him which days of the conference you will be attending.

## **International Conference on the History of Computing and Networks 25, 26 and 27 November 2002 - Grenoble France**

ACONIT, in partnership with AHTTI and FEB, is organising a conference on the History of Computing and Networks, to take place on 25, 26 and 27 November 2002 at the Museum of Grenoble.

The conference is one event of a series organised to celebrate fifty years of computing in Grenoble which also include an exhibition presented by IMAG, CCSTI of Grenoble and ACONIT.

You can consult our web site at [www.aconit.org/colloque2002](http://www.aconit.org/colloque2002) to see the programme of presentations and to register.

A list of hotels with pre-reserved rooms is also available on the web site. In order to take advantage of these rooms and reduced prices, mention “the conference on the History of Computing and Networks organised by ACONIT and IMAG” when you book the hotel. Note that, room pre-reservations expire at different dates for different hotels. After these dates, the price and the availability of the rooms is not guaranteed.

We are at your disposal for further information by telephone at +33 (0)4.76.48.43.60 or on email at [colloque2002@aconit.org](mailto:colloque2002@aconit.org)

## **Grand Meeting of the National Academy of Sciences of Ukraine and Scientific Conference devoted to the Centenary of Academician S.A. Lebedev**

### **\*Preliminary Announcement\***

Academician Sergei Alekseevich Lebedev was born on November 2, 1902. He began research in the field of computer technology in Kyiv, Ukraine, later successfully continuing this work in Moscow, Russia.

Lebedev designed the first electronic stored program computer in continental Europe—MESM—in 1951, in Kyiv. Over the course of his career, Lebedev developed and designed fifteen mass-produced supercomputers for the Soviet Union, including the BESM and other series.

Lebedev's centenary will be celebrated in Kyiv, Ukraine, on November 14-15, 2002, at the National Academy of Sciences of Ukraine, with the International Charitable Foundation for Computer Science and Technology (ICFCST).

Academy President Academician Boris Paton will open the ceremony on November 14 with a keynote address, followed by presentations from Lebedev's students and other participants.

November 15 will feature a workshop on "Information Technology in Ukraine: From a Worthy Past to Bright Future," at the Ukrainian State Polytechnical Museum. The Conference will focus on the history, development, and future of information technology in Ukraine and worldwide.

On November 16 tours of the Polytechnical Museum and MESM memorial room will be available.

Registration for participants will be on November 13, 2002.

The Conference program committee welcomes your paper proposals. Please send your proposal abstract and annotations to: Tamara Malashok, Conference Secretary, [icfcst@icfcst.kiev.ua](mailto:icfcst@icfcst.kiev.ua)

The full text of your paper in MS Word format will be required at registration. Conference proceedings will be published and sent to participants.

You may view the online conference announcement at:  
<http://www.icfcst.kiev.ua/conference2002>

We look forward to seeing you in Kyiv in November. Please inform us in advance about your arrival itinerary. Official invitations to the meeting will be sent in September.

On behalf of the ICFCST Organizational Committee,

Professor Boris N. Malinovsky.

Kyiv, Volodimirskaya St.  
45A, NASU House of Scientists

**Call for papers : Workshop on Information Systems and  
Technology in Organisations and Society  
Universitat Pompeu Fabra, Barcelona, Spain  
28-30 March 2003**

This workshop is a part of the research network “Tensions of Europe: Technology and the Making of 20th Century Europe”, sponsored by the European Science Foundation. (Further information see [www.histech.nl/Tensions/Default.htm](http://www.histech.nl/Tensions/Default.htm)).

The workshop will examine the role of information systems and technologies (IST) at different levels in society, ranging from individuals and organisations to society as a whole. It will cover developments in Europe during the twentieth century, looking in detail at three themes: user practices, the role of intermediaries and European competitiveness.

Information systems and technologies are broadly defined as objects of research. For the latter part of the twentieth century, they include computer hardware, software, software-based organisation systems and different forms of information exchange. For earlier periods, IST include predecessors of the computer, such as punch card-systems and keyboard office machines.

1. USER PRACTICES, focusing on how IST has influenced the work and tasks

of individuals (both at the shop floor and in offices) as well as the formal and informal organisational structures, which contain and accommodate users. This theme also welcomes studies of the implementation of IST in multinationals.

2. INTERMEDIARIES between producers and users (e.g. user communities, consulting firms, the media and government agencies), examining how they have influenced the development and implementation of IST in the European context. This theme includes the origin and evolution of consulting and software contracting firms.

3. EUROPEAN COMPETITIVENESS, looking mainly at the dynamics of corporate strategies in European IST industries related to other companies (including internationalisation, alliance formation and mergers) and related to governments (e.g. lobbying). Also, this theme includes studies of industrial policies on the national and trans-national levels. Comparative approaches are particularly welcome.

The overall objective of this workshop will be to contribute to the development of a research programme on information systems and technology in organisations and society. The current research programme is available at the ‘Tensions of Europe’ web site (above). We will intend to publish some or all of the papers from the workshop.

Please e-mail a one-page abstract of your paper together with a few lines of biographical information and your contact details by 31 October

2002 to Lars Heide ([heide.lpf@cbs.dk](mailto:heide.lpf@cbs.dk)). Please send it as an attachment in pdf or MS Word (any Word version) format.

The proposals will be reviewed by the Project Team on Information Systems and Technology in Organisations and Society: Jan van den Ende, Erasmus University

Rotterdam, Lars Heide, Copenhagen Business School, Matthias Kipping (Co-ordinator), Universitat Pompeu Fabra, Barcelona, and University of Reading, Pierre Mounier-Kuhn, CNRS and University of Paris-Sorbonne, Cecilia Pahlberg, University of Uppsala, Aristotle Tympas, Panteion University, Athens and Robbie Guerriero Wilson, University of Stirling. Contact information is available on the 'Tensions of Europe' web site.

### TIMETABLE

Deadline for proposals (abstracts): 31 October 2002

Notification of acceptance: 30 November 2002

Deadline for final papers: 1 March 2003

The organizers will pay local costs (accommodation and food) for all those giving a paper (one person per paper). Some help with transportation costs might also be available, especially for those currently completing or having recently completed a dissertation. Please contact Matthias Kipping (matthias.kipping@econ.upf.es) for further details.

## Recent Publications

Burke, Colin. "The Ford Foundation's Search for an American Library Laboratory" *IEEE Annals of the History of Computing* 24:3 (July-September 2002) 56-74.

Butter, Andrea and David Pogue. *Piloting Palm: The Inside Story of Palm, Handspring, and the Birth of the Billion-dollar Hand-held Industry* (New York: Wiley, 2002).

Griffiths, José-Marie and Donald W. King. "US Information Retrieval System Evolution and Evaluation (1945-1975)" *IEEE Annals of the History of Computing* 24:3 (July-September 2002) 35-55.

Hansen, Per Brinch, ed. *Classic Operating Systems* (Berlin: Springer Verlag, 2001).

Hewitt, Hermi M. "Passing on More Than a Blank Disc: a Task for Nursing Historians" *Nursing History Review* 9 (2001) 207-215.

Hook, Diana H. and Jeremy M. Norman. *Origins of Cyberspace: a Library on the History of Computing, Networking, and Telecommunications* (Novato, CA: historyofscience.com, 2002).

Leslie, Stuart W. "Regional Disadvantage: Replicating Silicon Valley in New York's Capital Region." *Technology and Culture* 42:2 (April 2001) 236-264.

Leslie, Stuart W. "Blue Collar Science: Bringing the Transistor to Life in the Lehigh Valley." *HSPS* 32:1 (2001) 71-113.

Malone, Cheryl Knott. "Imagining Information Retrieval in the Library: *Desk Set* in Historical Context" *IEEE Annals of the History of Computing* 24:3 (July-September 2002) 14-22.

Marcum, Deanna B. "Automating the Library: The Council on Library Resources" *IEEE Annals of the History of Computing* 24:3 (July-September 2002) 2-13.

Robert E. Mitchell and Thurtle, Philip, eds. *Semiotic Flesh* (Seattle, WA: University of Washington Press, 2002).

Rosenau, James N. "Information Technologies and Global politics: The Changing Scope of Power and Governance" *SUNY Series in Global Politics* (Albany: State University of New York, 2002).

Segesta, Jim and Keith Reid-Green. "Harley Tillit and Computerized Library Searching" *IEEE Annals of the History of Computing* 24:3 (July-September 2002) 23-34.

Stauffer, David. *Business the Sun Way: Secrets of a New Economy Megabrand* (Oxford: Capstone, 2002).

*Compiled by Jeffrey R. Yost*

## 30 Years Ago

In 1972, the Hewlett-Packard Company introduced its first pocket calculator, the HP-35. Designed for scientists and engineers, it could perform trigonometric, logarithmic, and mathematical functions, each with a single keystroke. Features of the HP-35 included accuracy up to ten significant digits, a four register operational stack (for holding intermediate results), an LED display, and a rechargeable battery pack that provided at least five hours of battery operation. The calculator was sometimes referred to as the "electronic slide rule," and is often credited with making the conventional slide rule obsolete. At co-founder William Hewlett's insistence, the HP-35 was literally the size of a shirt pocket. It measured approximately 3" x 6" x 1" and weighed only nine ounces. The HP-35 sold for \$395.

Hewlett-Packard stressed the power and portability of the HP-35 in advertising and product literature for the calculator. One advertisement noted that a user of the HP-35 would always have reliable calculations, "in a meeting, at home, in a plane, in a hotel room, at a remote project site – anywhere in the world." Another advertisement called the HP-35 the "first electronic 'answer machine'" that offered users both the "problem-solving power of a small computer" and the "portability and convenience of the slide rule." The advertisement also included an actual-size illustration, which readers were

encouraged to detach and put in their shirt pocket so they could see how easily the HP-35 fit. The HP-35 was discontinued in 1975.

*Carrie Seib*