

CBI Seeks Early ACM Records

The Association for Computing Machinery (ACM) marked its fortieth anniversary at the Fall Joint Computer Conference in Dallas this year. Originally formed as the Eastern Association for Computing Machinery, the group has grown to become the premier professional organization of its kind. However, few records of its activities have been preserved, and its first twenty years are likely to be completely undocumented unless an immediate effort is made to locate and preserve the organization's early records.

The situation is particularly critical for ACM since it had no headquarters until the early 1960s. After headquarters were established in New York, the ACM relocated a number of times, further reducing any chance that early records had survived. Indeed, officials at ACM doubt that many records prior to 1965 remain at headquarters.

Individuals, especially past officers, are likely to be the best remaining source of documents. Some collections of records with materials about the ACM are already held by archival institutions. One of the best collections of early records is held at the Federal Records Center in Suitland, Maryland. It contains some minutes of the first meetings and various abstracts of conference papers collected by the National Bureau of Standards (accession 167-79-19, box 1; currently permission for access to the records must be secured from the National Bureau of Standards). The Smithsonian Institution has a collection of computer societies and user group records which includes some ACM records. Stanford University's Department of Special Collections lists ACM records in the George and Alexandra Forsythe papers. At CBI, ACM records are found in the personal papers of George Glaser (former treasurer of ACM) and Carl Hammer, as well as the History of Programming Languages Conference records and ACM conference photographs from the 1970s. Most of these collections are briefly described in CBI's 1987 publication, *Resources for the History of Computing*.

There is some confusion about the existence of the ACM archives. In 1961, the

president, Harry D. Huskey, described a collection of "early reports and manuals on computers and programming systems" brought together largely by Robert Bemer. He further proposed a repository for "new manuscripts, manuals, reports" and other publications. This was followed in 1962 by the establishment of a repository of computer documents at the Moore School, part of a joint venture between the ACM and the University of Pennsylvania. Morris Rubinoff and John White described the indexing system of the "ACM Repository" in the *Communications of the ACM* (October, 1965, 595-601). However, the repository became inactive shortly after this period. At some point this collection became known as the "ACM Archives," although it actually contained few documents from the organization (*Communications of the ACM*, July, 1972, 490). CBI eventually received part of this collection, thus reinforcing the erroneous impression that ACM's "archives" were being preserved. While the ACM collection of manuals and computer literature has proven to be a valuable historical resource, it unfortunately does not document the history of ACM.

In order to remedy this situation, CBI is currently working to identify and preserve existing collections relating to ACM. Of greatest concern is the preservation of records documenting internal operations during its first quarter century. These include meeting minutes, correspondence, memoranda, organizational documents, photographs, and other materials. Over the next year the CBI archivist will be contacting former officers of ACM and other individuals who were likely to have held such records. We would be grateful for any information about extant records.

Generally the major publications of the ACM are well-preserved by libraries and microfilm publishers. However, the proceedings of the ACM were published only after 1951, and few copies of the original presentations have been found. CBI is attempting to reassemble these first conference proceedings, and would appreciate

receiving the texts of any of the presentations. The locations and dates of the five conferences are listed below:

1. Ballistic Research Laboratories, Aberdeen Proving Ground, Aberdeen, MD, December 11-13, 1947
2. Oak Ridge National Laboratory, Oak Ridge, TN, April 18-20, 1949.
3. Rutgers University, New Brunswick, NJ, March 28-29, 1950.
4. Shoreham Hotel, Washington, DC, September 7-9, 1950.
5. Wayne University, Detroit, MI, March 27-28, 1951.

A list of conference presentations from 1947 to 1951 has been compiled from reports issued by the ACM and listings found in *Mathematical Tables and Other Aids to Computation*. The presentations represent an exciting range of topics, and they would be extremely useful for researchers of the early history of computing. It is likely that some were never written, and only a few are known to have been published. Abstracts of some of the presentations were found in the NBS collection at the National Archives (previously mentioned); they are noted by an asterisk (*). Texts of presentations that are known to be available are indicated by at. The year refers to the conference; since there were two conferences in 1950, presentations at the Washington conference are noted as 1950-W. Individuals wishing further information should contact the CBI Archivist.

LIST OF ACM CONFERENCE PRESENTATIONS, 1947-1951

- Aiken, Howard H. (Computation Laboratory, Harvard University) *Automatic Computing Machinery Of Moderate Cost*, 1950
- Aiken, Howard H. (Computation Laboratory, Harvard University) *Automatic Computing Machines and Their Applications*, 1951
- Alexander, S. N. (National Bureau of Standards) *An Intercomparison Of Storage Devices*, 1949

Symposium Focuses on Information Technologies in Historical Context

On September 11, 1987, the Charles Babbage Institute and the Smithsonian Institution's National Museum of American History convened a symposium in Washington on Information Technologies in Historical Context. The purpose of the meeting was to broaden the perspective of the growing body of scholarship on the history of digital computers and other information technologies. It was hoped that this symposium would help to chart directions for historical research in the coming years. A further objective was to obtain guidance for the museum staff in the planning of their forthcoming information exhibition. To these ends, 35 distinguished British and North American computer historians, business historians, cultural historians, historians of technology, and sociologists gathered to discuss a wide range of issues related to information technologies in the nineteenth and twentieth centuries.

The discussion followed from four position papers prepared and circulated in advance of the meeting: "The History of Computing in the History of Technology," "The History of Computing in Business and Economic History," "The History of Information Technology in the Context of Social and Cultural History," and "The Information History Exhibit of the National Museum of American History." Copies of these papers and further information about the symposium are available upon request. □

SYMPOSIUM PARTICIPANTS

David Allison
National Museum of American History
Smithsonian Institution

William Aspray
Charles Babbage Institute

Gwen Bell
The Computer Museum

James R. Beniger
Annenberg School of Communications
University of Southern California

Bruce Bruemmer
Charles Babbage Institute

Colin Burke
Department of History
University of Maryland Baltimore County

Paul Ceruzzi
National Air and Space Museum
Smithsonian Institution

Robert Lee Chartrand
Congressional Research Service
Library of Congress

I. Bernard Cohen
History of Science Department
Harvard University (emeritus)

Edward Constant
Department of History
Carnegie-Mellon University

Cynthia Costello
Villers Foundation

Jon Eklund
National Museum of American History
Smithsonian Institution

Douglas Evelyn
National Museum of American History
Smithsonian Institution

Bernard Finn
National Museum of American History
Smithsonian Institution

Margaret Graham
School of Management
Boston University

Sheldon Hochheiser
Charles Babbage Institute

Karl Hufbauer
Department of History
University of California-Irvine

Roger Kennedy
National Museum of American History
Smithsonian Institution

Daniel Kevles
Humanities Division
California Institute of Technology

J. A. N. Lee
Department of Computer Science
Virginia Polytechnical Institute

Michael Mahoney
Program in History of Science
Princeton University

Peter Mathias
Old Souls College
University of Oxford

Marie Mattson
National Museum of American History
Smithsonian Institution

Bruce Mazlish
Department of History
Massachusetts Institute of Technology

Uta Merzbach
National Museum of American History
Smithsonian Institution

Arthur Molella
National Museum of American History
Smithsonian Institution

Clifford Nass
Department of Communications
Stanford University

Dorothy Nelkin
Science and Technology Studies
Cornell University

Arthur Norberg
Charles Babbage Institute

Emerson Pugh
Research Center, Yorktown Heights
IBM

Robert H. Wiebe
Department of History
Northwestern University

Michael Williams
Department of Computer Science
University of Calgary

JoAnne Yates
Sloan School of Management
Massachusetts Institute of Technology □

CHARLES BABBAGE INSTITUTE NEWSLETTER

The Charles Babbage Institute, The Center for the History of Information Processing, is sponsored by the information processing community and the University of Minnesota. Arthur L. Norberg, Director.

The Charles Babbage Institute Newsletter is a publication of the Charles Babbage Institute, University of Minnesota, 103 Walter Library, 117 Pleasant Street S.E., Minneapolis, Minnesota 55455, telephone (612) 624-5050. The Newsletter reports on Institute activities and other developments in the history of information processing. Permission to copy without fee all or part of this material is granted provided that the source is cited and a copy of the publication containing the copied material is sent to the Institute.
©The Charles Babbage Institute for the History of Information Processing.

Electronic Mail Addresses for CBI and Staff

Charles Babbage Institute:
CBI@umnacvx.bitnet

Arthur L. Norberg, Director:
ANorberg@umnacvx.bitnet

William Aspray, Associate Director:
WAspray@umnacvx.bitnet

Bruce H. Bruemmer, Archivist:
BBruemmer@umnacvx.bitnet

Italian Activities in the History of Computing

(This article was prepared by Corrado Bonfanti, head of the working group for the history of computing of A.I.C.A. and Italian representative to the IFIP history committee.)

In 1961 the Associazione Italiana per l'Informatica ed il Calcolo Automatico (A.I.C.A.) was founded and affiliated itself with IFIP. In 1983 it formed a Working Group for the History of Computing proposed by Corrado Bonfanti. At their first meeting, at the annual A.I.C.A. conference in Naples in October 1983, the Working Group defined its aim and scope:

- to promote research, documentation, and wide dissemination of information about the history of automatic computing and informatics, with special emphasis on the Italian environment;
- to carry on editorial initiatives as well as meetings, conferences, and exhibits on related subjects.

A.I.C.A. is a volunteer agency, which cannot provide the logistical or personnel

support for ambitious initiatives like a computer museum or an historical archive. However, it takes as an objective the stimulation of such initiatives in public and private institutions with the resources to carry out such activities. In the area of hardware preservation and display, the Working Group has advised and encouraged the P.P.TT. Museum in Rome, the Institute and Museum for the History of Science in Florence, and the National Museum of Science and Technology in Milan. The Working Group has been instrumental in arranging the support that the Rome and Milan museums have received from Honeywell and IBM, respectively.

At the annual A.I.C.A. meeting in Rome in 1984, the Working Group mounted its first historical show (on 25 illustrated 100 x 100 cm panels) and published an accompanying brochure, entitled "Informatics in Italy from the Origins to 1970: A Retrospective." A revised edition of the brochure was printed in September 1987. In 1986 the Working Group

prepared an eight-page illustrated leaflet giving a concise history of the first 25 years of A.I.C.A. At the A.I.C.A. 1987 annual meeting in Trento a larger and more comprehensive history show, entitled "From QUIPU to the Chip," was displayed. Prepared by Franco Soresini, the exhibit included 52 illustrated panels, and approximately 100 computing instruments and devices, and about 60 books. Materials were provided for the exhibit by public and private museums, computer firms (Honeywell Bull, IBM, and Olivetti), and private collectors. The Working Group is currently editing a historical collection of papers for 1988 publication, and is planning additional historical activities for its 1988 annual meeting in Perugia.

For further information, please contact Dr. Corrado Bonfanti, c/o INFORMATICA Friuli- Venezia Giulia S.p.A., Via S. Francesco d'Assisi 43, I - 34133 Trieste, Italy. □



A photograph of the Olivetti Elea 6001 at the Università degli Studi di Pavia. The 6001 became available in 1961 and was sold as a transistorized, scientific computer. The photograph was donated to CBI from Olivetti.

Manchester Meetings on the History of Computing, July 1988

Several meetings will be held in Manchester, England the week of July 11, 1988 with programs related to the history of computing. July 12-14 there will be a joint meeting of the British Society for the History of Science and the History of Science Society. Tuesday, July 12, 2:00-4:00 PM, there will be a session on the history of computing organized by Geoffrey Tweedale (British Archives for History of Computing). Martin Campbell-Kelly (University of Warwick) will speak on British developments, Eda Kranakis (Universiteit Van Amsterdam) will discuss early computing activities in the Netherlands, and William Aspray (CBI) will survey the commercialization of the computer in the United States, 1955-65. Wednesday, July 13, 11:00-12:30 PM, there is a session on The Business of Science and Technology: Recent Work on the History of Industrial Research. In that session Arthur Norberg (CBI) will lecture on "Punching Cards to Magnetising Cores: Industrial Research and Development's Role in Changing Machine Computation Methods, 1925-1955." Commentary will be provided by Jeffrey Sturchio (AT&T) and Michel Caillon (Ecole de Mines).

On Friday, July 15, the British Archives for the History of Computing and the Charles Babbage Institute will jointly sponsor an all-day meeting on the history of computing. The purpose is to bring together Americans and Europeans interested in the history of computing to exchange views, learn about other projects, and meet other people with similar interests. The morning will be devoted to a program commemorating the fortieth anniversary of the first Manchester computer. The afternoon session will involve several short talks on the activities of the major centers investigating the history of computing, and an open forum for individuals to describe their own work and plans, and to hear about those of others. Topics for the afternoon session include:

- archival collections, collection policies, and collection plans
- historical research completed, underway, or planned
- needs and opportunities for further archival collection and historical research

The meeting is modelled after a meeting the Babbage Institute organized in May 1986 for American archivists and historians (see the Summer 1986 CBI Newsletter), and a joint CBI-Smithsonian meeting in September 1987 (see the article on page one). All people interested in collecting archival material or conducting research in the history of computing are welcome to attend.

For fees, registration, and further information about the BSHS-HSS meeting please contact: Dr. John Pickstone, Centre for

the History of Science, Technology, and Medicine, Mathematics Tower, University of Manchester, Oxford Road, Manchester M13 9PL, England. There is no fee to attend the ancillary British Archives-Babbage Institute meeting, but we would appreciate it if you would notify us if you plan to attend. No funds are available to support travel or allowance for either meeting. □

Rutishauser Papers Catalogued

The ETH - Bibliothek in Zürich, Switzerland has recently completed the processing of the manuscripts and correspondence of Heinz Rutishauser (1918-1970), professor of applied mathematics at the ETH Zürich. A detailed catalog of the collection is available. For further information, contact Dr. Beat Glaus, ETH - Bibliothek, Ramistrasse 101, CH-8092 Zürich, Switzerland. □



Herman Goldstine, colleague of John von Neumann at the Institute for Advanced Study, is standing in front of a commemorative plaque on the house in Budapest, Hungary, where von Neumann grew up. The photograph was taken in March 1987 at a National Meeting on Microcomputers organized by the John von Neumann Society for Computing Sciences. (Photograph courtesy of Győző Kovács, Vice President of the John von Neumann Society.) □

Recent Publications

- H. W. Buxton, *Memoir of the Life and Labours of the Late Charles Babbage Esq. F.R.S.*, Vol. 13, CBI Reprint Series for the History of Computing. Editing and new introduction by Anthony Hyman. (Cambridge, MA: MIT Press; Los Angeles: Tomash Publishers, 1988.) ISBN0262022699.
- James W. Cortada, *Historical Dictionary of Data Processing*, 3 Vols., Vol. 1: Technology; Vol. 2: Organizations; Vol. 3: Biographies. (New York: Greenwood Press, 1987.) ISBN0313256527, 0313233039, 0313256519, respectively.
- Maurice d'Ocagne, *Le Calcul Simplifié: Graphical and Mechanical Methods for Simplifying Calculation*, Vol. 11, CBI Reprint Series for the History of Computing. Translated and introduction by J. Howlett and M. R. Williams. (Cambridge, MA: MIT Press; Los Angeles: Tomash Publishers, 1986.) ISBN0262150328.
- Wladyslaw Kozaczuk, *Enigma*, translated by Christopher Kasperek. (Frederick, MD: University Publications of America, 1984.)
- John von Neumann, *Papers of John von Neumann on Computing and Computer Theory*, Vol. 12, CBI Reprint Series for the History of Computing. Edited and introduction by William Aspray and Arthur Burks. (Cambridge, MA: MIT Press; Los Angeles: Tomash Publishers, 1987.) ISBN026222030X.
- Judith A. Perrolle, *Computers and Social Change: Information, Property, and Power*, (Belmont, CA: Wadsworth, 1987.) Partly historical. ISBN0534074642.
- James E. Tomayko, *Computers in Spaceflight: The NASA Experience*, Encyclopedia of Computer Science and Technology, Vol. 18, Supp. 3. (New York, 1987.)
- *Daedalus* (American Academy of Arts and Sciences), Winter 1988, issue on artificial intelligence. Several articles contain descriptions of historical developments.
- H. Zemanek, editor, *A Quarter Century of IFIP* (Proceedings of the 25th Anniversary Celebration of IFIP Munich, 27 March 1985), (Amsterdam: North-Holland, 1986). ISBN044470003X.
- Articles of Interest
William Aspray, "The Mathematical Reception of the Modern Computer: John von Neumann and the Institute for Advanced Study Computer," in *Studies in the History of Mathematics*, Esther R. Phillips, editor, Vol. 26 in the series *Studies in Mathematics*, (Washington, DC: Mathematical Association of America, 1987), pp. 166-194.

continued on page 7. . .

continued from page 1 . . .

- Alt, F. L. (Aberdeen Proving Ground) *Operating Characteristics Of The Aberdeen Machines*, 1947
- Andrews, Ernest G. (Bell Telephone Laboratories) *Problems Solved On B. T. L. Model VI Computer*, 1951
- Belzer, J. (Ohio State University) *Some Thermodynamic Tables Obtained On Punched-Card Machines*, 1950-W*
- Belzer, J.; Johnston, H. L.; Savedoff, Lydia (Department of Chemistry, Ohio State University) *602A Calculating Punch—Time Saver In Computing Thermodynamic Properties Of Gases*, 1949
- Bergman, S.; Schiffer, M. M. (Harvard University) *Numerical Methods In The Theory Of Linear Partial Differential Equations*, 1950-W
- Berkeley, Edmund C. (New York) *The Relations Of Symbolic Logic and Large-scale Calculating Machines*, 1949*†
- Blanch, Gertrude (National Bureau of Standards) *Inversion of Large Matrices*, 1949*
- Bosworth, S. (Computer Corporation Of America) *Considerations in the Design of a Flexible Low Cost Differential Analyzer*, 1951
- Caldwell, Samuel H. (MIT) *Analog and Special-Purpose Computing Machines*, 1949*
- Campbell, Robert V. D. (Raytheon) *The Raytheon Computer*, 1947*
- Cannon, Edward W. (National Bureau of Standards) *Limitations of Electronic Digital Computing Machines*, 1949
- Cheydleur, B. F. (Naval Ordnance Laboratory) *Binary Notation in Arithmetic Algorithms and Operation Code Partitions*, 1949
- Cheydleur, B. F.; Smith, H. A. (Naval Ordnance Laboratory) *Function Control Panel for Card Programmed Electronic Calculator*, 1951
- Clippinger, R. F. (Aberdeen Proving Ground) *Adaptation of the ENIAC to von Neumann's Coding Techniques*, 1947*
- Clippinger, R. F. (Aberdeen Proving Ground) *Air Flow Problem Planned for the ENIAC*, 1947
- Clippinger, R. F.; Dimsdale, Bernard (Aberdeen Proving Ground) *A Machine Method for Solution of Systems of Ordinary Differential Equations*, 1950*
- Clippinger, R. F.; Dimsdale, Bernard (Aberdeen Proving Ground) *The Register Code for the ENIAC*, 1949
- Coleman, John S. (Burroughs Adding Machine Company) *Electronics for Business - Luxury or Necessity?*, 1951
- Cooley, E. F. (Prudential Insurance Co.) *The Impact of Business on Computing Machinery Design*, 1951*

CBI Fellowship Awarded



Shane Mitchell Greenstein

The 1988-89 Charles Babbage Institute Predoctoral Fellowship has been awarded to Shane Mitchell Greenstein, a graduate student in the Department of Economics at Stanford University. He is writing a dissertation on "Computers, Compatibility, and Economic Choice" under the direction of Professor Timothy Bresnahan. The dissertation will perform an economic analysis of U.S. federal government agency computer system supplier choice, focusing on the importance of previous user experience with computer system suppliers in shaping computer technology choice. It will be primarily concerned with the empirical question of economic importance: did the costs of switching between suppliers of

(potentially) incompatible equipment significantly affect a buyer's choice of system supplier in practice in the 1970s? The dissertation is based largely on an analysis of the Federal Automatic Data Processing inventories from the 1970s, made available to him by IBM Corporation.

Although the dissertation is primarily economic in nature, it addresses a number of issues of interest to the history of computing. It will investigate the role of switching costs in the development of computer markets. It will illuminate the processes of government computer use and selection. And it is hoped that it will stimulate further economic research into the relevance of historical processes for the development of markets of networks of technically interrelated components, such as computer systems (e.g., of how buyer incentives to continue with compatible technologies shape the design of technically complex systems).

Mr. Greenstein was awarded the bachelor of arts degree from the University of California, Berkeley in 1983. At Stanford he has assisted with research projects on domestic automobile assembly capacity, aluminum market equilibrium, and the economics of standardization. His research interests include applied microeconomics and econometrics, industrial organization, economics of technology, and economic history.

- Crawford, Perry (Research and Development Board) *High-Speed Computing Machines—a Survey*, 1950
- Curry, Haskell B. (Pennsylvania State College) *A Logical Analysis of Program Composition*, 1949*
- Curtiss, John H. (National Bureau of Standards) *Probability Methods in the Solution of Elliptic Partial Differential Equations*, 1950
- Curtiss, John H. (National Bureau of Standards) *The Role of a Central Computing Laboratory*, 1950-W
- Daniels, Howard L. (Engineering Research Associates, Inc.) *A Photographic High-Speed Printer (300-3000 Characters Per Second)*, 1950-W
- Dantzig, G. B. (Office of the Air Comptroller, USAF) *Application of the SEAC to Linear Programming*, 1950-W*
- Dimsdale, Bernard (Aberdeen Proving Ground) *Preparation of a Theodolite Problem for Large-Scale Machines*, 1951
- Dryden, H. L. (National Advisory Committee for Aeronautics) *Applications of High-Speed Computing in Aeronautical Research*, 1950-W*
- Eckdahl, Donald E. (Northrop Aircraft, Inc.) *The Maddida, Design Features*, 1950*

- Elliott, William S. (Elliott Brothers, Ltd.) *Digital Computing Machine Components of Universal Application*, 1950
- Everett, Robert R. (Massachusetts Institute of Technology) *Digital Computer Research at M.I.T.*, 1951
- Feder, Donald P.; Handy, Benjamin (National Bureau of Standards) *Optical Ray Tracing*, 1950*
- Fein, Louis (Raytheon) *Automatic Checking Features of the Raytheon Digital Computer*, 1951*
- Fritz, W. Barkley (Aberdeen Proving Ground) *The ENIAC—A Five Year Operating Survey*, 1951*
- Hagan, Glenn E. (Northrop Aircraft, Inc.) *Engineering Applications on the MADDIDA*, 1951
- Harrison, Joseph (Eckert-Mauchly Computer Corporation) *A UNIVAC Program for Inventory Requirements*, 1951
- Hershey, Allen V. (Naval Proving Ground) *The Programming of Some Matrix Computations for the MARK II Aiken Relay Calculator*, 1951
- Hicks, Bruce L. (Aberdeen Proving Ground) *Non-Linear Parabolic Equations*, 1947

continued on page 6 . . .

Recognize These Photos?



CBI needs your help in identifying the computer or the individuals. The photographs were part of a large reference collection assembled by the late Albrecht J. Neumann. They were filed with excellent shots of the ENIAC, SAGE, and Whirlwind computers. The entire collection, recently donated to CBI by Mrs. Neumann, consists of over 25 cubic feet of computer manuals, product literature, technical reports, and material related to Neumann's work at the National Bureau of Standards.

continued from page 5. . .

Hicks, Bruce L.; Levin, J. H.; Lotkin, M.; Clippinger, R. F.; Holberon, J. V. (Aberdeen Proving Ground) *Partial Differential Equations*, 1947

Hill, John L. (Engineering Research Associates, Inc.) *Design Features of a Magnetic Drum Information Storage System*, 1950*†

Hoffleit, Dorrit (Aberdeen Proving Ground) *Reduction of Doppler Observations*, 1947*

Holberton, John V. *Laminar Boundary Flow in a Compressible Fluid*, 1947

Householder, A. S. (Oak Ridge National Laboratory) *Calculation of Neutron Age by Monte Carlo*, 1949

Huntoon, R. D. (National Bureau of Standards) *The Impact of High-Speed Computing on Atomic Research*, 1950-W

Hurd, Cuthbert C. (International Business Machines Corporation) *The IBM Card-Programmed Electronic Calculator*, 1950

Hurd, Cuthbert C. (International Business Machine Corporation) *The IBM Defense Calculator*, 1951

Huskey, Harry D. (National Bureau of Standards) *Statistical Theory of Round-Off Errors*, 1949

Hyman, M. A. (U.S. Naval Ordnance Laboratory) *On the Non-Iterative Numerical Solution of Boundary Value Problems*, 1950-W*

Kalin, Theodore (Computation Laboratory, Harvard University) *Logical Design of Direct-Coupled Vacuum Tube Control Circuits*, 1949*

King, Gilbert W. (Arthur D. Little, Inc.) *The Digital Reader*, 1951*

King, Gilbert W. (Arthur D. Little, Inc.) *The Statistical Mechanics of High Polymers*, 1949

Kjellberg, Goran *The Bark, a Swedish General-Purpose Relay Computer*, 1950*

Lehmer, D. H. (University of California, Berkeley) *The Effect of High-Speed Computing on Mathematical Research*, 1950-W*

Leiner, A. L. (National Bureau of Standards) *Provision for Expansion of the SEAC*, 1950-W†

Levin, Joseph H. (National Bureau of Standards) *The Treatment of Systems of Differential Equations on the SEAC*, 1951*

Linvell (?), William K. and Salzer, John M. *Analysis of Digital Computers in Control Systems*, 1951*

Lotkin, Mark (Aberdeen Proving Ground) *Computation of the Airflow About a Cone Cylinder*, 1947

Lotkin, Mark (Aberdeen Proving Ground) *On the Accuracy of Runge-Kutta's Method*, 1951

Lotkin, Mark; Johnson, C.E. (Aberdeen Proving Ground) *Theodolite Reductions on the IBM Relay Computers*, 1950

Lubkin, Samuel (Electronic Computer Corporation) *A Digital Computer for Solution of Simultaneous Linear Equations*, 1950*

Lubkin, Samuel (Electronic Computer Corporation) *Modulatory Type Flip-Flop*, 1951*

Lubkin, Samuel (National Bureau of Standards) *The NBS Interim Computer*, 1949*

Marden, Ethel C. (National Bureau of Standards); Crown, J. Conrad (Naval Ordnance Laboratory) *Solution of the Non-Linear Inviscid Supersonic Flow Equations of the SEAC*, 1951*

Mauchly, John W. (Eckert-Mauchly Computer Corporation) *Applications of the BINAC*, 1950

Mauchly, John W. (Electronic Control Company) *The UNIVAC*, 1947

McPherson, James L. (Census Bureau) *Census Applications for High Speed Computing Machines*, 1947*

McPherson, James L. (Bureau of the Census) *Plans for Tabulating Parts of the 1950 Population Census on an Electronic Computer*, 1951

McPherson, James L.; Koons, Florence K.; Mullendore, Ralph E. (Bureau of Census) *Applications of Electronic Computers to Census Bureau Problems*, 1950*

continued on page 7. . .

continued from page 6. . .

- McPherson, James L.; Koons, Florence K.; Mullendore, Ralph E. (Bureau of the Census) *Application of Large-Scale High-Speed Computing Machines to Statistical Work*, 1950
- Mendelson, Myron J. (Northrop Aircraft, Inc.) *Mathematical Techniques in the Uses of MADDIDA*, 1951
- Mengel, Arnold S. (Rand Corporation) *Optimum Trajectories*, 1951*
- Miller, Frederick G. (Naval Proving Ground) *New Circuits Installed in the Aiken Relay Calculator*, 1950
- Miller, J. C. P. (National Bureau of Standards) *Number-Theoretical Problems on the SEAC*, 1950-W
- Mitchell, Jr., Herbert F. (Eckert-Mauchly Computer Corporation) *Matrix Algebra Programs for the UNIVAC*, 1951
- Mitchell, Jr., Herbert F. (Eckert-Mauchly Computer Corporation) *Solution of Matrix Equations of High Order by an Automatic Computer*, 1950
- Mooers, Calvin M. (Zator Company) *The Theory of Digital Handling of Nonnumerical Information and Its Implications to Machine Economics*, 1950*†
- Moore, Benjamin L. (Harvard University) *Preliminary Design of the MARK IV*, 1950*
- Morton, Paul L.; read by Smith, C. V. L. (University of California) *Design of a Low-Cost Computer*, 1950
- Murray, Francis J. (Columbia University) *Planning and Error Consideration in the Numerical Integration of a Difference Equation*, 1950
- Newman, M. H. A. (University of Manchester) *Additive Constants in Machine Programs*, 1950-W
- Nims, Paul T. (Chrysler Corp.) *Some Computing Problems in the Automotive Industry*, 1951†
- Patterson, George W. (Burroughs Adding Machine Company) *Reversing Digit Number System*, 1951
- Pepinsky, Raymond (Alabama Polytechnic Institute) *Analog Computer for Fourier Transforms in Crystal Analysis*, 1949
- Perry, C. L. (Oak Ridge National Laboratory) *The Determination of a Potential Using the Fairchild Electronic Digital Computer [this paper was scheduled but not given]*, 1950-W*
- Rajchman, Jan A. (RCA) *Recent Progress on the Selectron*, 1949*
- Rajchman, Jan A. (RCA) *The SB-256 Electrostatic Selective Storage Tube*, 1950†
- Rees, Mina (Office of Naval Research) *The Federal Computing Machine Program*, 1950-W
- Rees, Mina (Office of Naval Research) *The Forgotten Man of Computing*, 1949
- Rehler, K. M. (Raytheon) *The External Memory of the Raytheon Digital Computer*, 1951*
- Rhodes, Ida R. (National Bureau of Standards) *Capabilities and limitations of Existing Electronic Equipment*, 1951
- Room, T. G. (University of Sydney) *Computing Machinery in Australia*, 1949
- Rose, M. E. (Oak Ridge National Laboratory); Spinrad, Bernard (Argonne National Laboratory) *Internal Conversion Calculation on MARK I*, 1949
- Ross, Clarence (Naval Proving Ground) *Experience With the Use of the Aiken Relay Calculator*, 1949
- Schell, Emil (Office of the Air Comptroller, USAF) *Problems in Linear Programming*, 1949
- Scherberg, Max G. (Office of Air Research) *An Analog Series Computer*, 1950*
- Seeger, R. J.; Polachek, H. (Naval Ordnance Laboratory) *On the numerical Solution of One-Dimensional Aerophysical Problems Involving Shocks*, 1950-W
- Shapin, Jr., Theodore; Moore, E. F. (University of Illinois) *Preliminary Considerations on a Magnetic Drum Controlled Computer*, 1951
- Shaw, R. R. (Department of Agriculture); McGeoghegan, M. E. (Department of Treasury); Rabinow, J. (National Bureau of Standards); Savage, D. (Remington Rand, Inc.); Travis, I. (Burroughs Adding Machine Co.); Daniels, H. L. (Engineering Research Associates, Inc.)—Participants in: *Panel Discussion on the Potentialities and the Need for Electronified [sic] Filing and Records Systems*, 1950-W
- Slutz, Ralph J. (National Bureau of Standards) *Remote Control Demonstration of The SEAC*, 1950-W
- Slutz, Ralph J. (National Bureau of Standards) *Uses of pulse Transformer in A-C Computers or Technical Features of the NBS Computer*, 1949
- Spinrad, Bernard *Internal Conversion Calculation on MARK I*, 1949
- Sprague, R. E. (Computer Research Corporation) *Techniques in the Design of Digital Computers*, 1951
- Stark, Richard H. (Los Alamos Scientific Laboratory) *Floating Decimal Calculations on the Card Programmed Electric Calculator*, 1951
- Steele, Floyd G. (Northrop Aircraft, Inc.) *The MADDIDA, General Features*, 1950*
- Stibitz, George R. (Burlington, VT) *Machines of Moderate Cost*, 1950
- Stibitz, George R. (Burlington, VT) *Optimum Size of Automatic Computers*, 1947*
- Stibitz, George R. (Burlington, VT) *The Philosophy of Computing Machine Design*, 1949*
- Stone, J. J. (Fairchild Engineering and Airplane Corporation) *The Operation of the Fairchild Specialized Digital Computers*, 1951
- Thomas, L. H. (IBM) *Computing Statistical Atomic Fields on the Selective Sequence Electronic Calculator*, 1949
- Thomas, L. H. (IBM) *Integrating Systems of Ordinary Differential Equations*, 1950-W*
- Todd, John (National Bureau of Standards) *Some Recent Experiments With the Monte Carlo Method*, 1950-W*
- Von Neumann, J. (Institute for Advanced Study). *General Principles of Coding With Application to the ENIAC*, 1947*
- Von Neumann, J. (Institute for Advanced Study) *High-Speed Computation in Programming and Planning*, 1950-W
- Weiner, James R. (Eckert-Mauchly Computer Corporation) *The BINAC—A Technical Report*, 1950*
- White-Wagner, George [New Register Code for the ENIAC], 1949
- Whitehead, D. L. (Westinghouse Electric Corporation) *The Anacom, A Large-Scale General-Purpose Analog Computer*, 1950*†
- Wilkes, M. V. (University of Cambridge) *Operational Experience on the EDSAC*, 1950-W
- Wood, Marshall K. (Department of the Air Force) *Applications of Computing Machines to the Solution of Management Problems*, 1950
- Zagor, Herbert (Reeves Instrument Corporation) *Engineering Applications of Electronic Analog Computers*, 1950 □

continued from page 4. . .

Allan G. Bromley, "The Evolution of Babbage's Calculating Engines," *Annals of the History of Computing*, 9 (1987):113-136.

Martin Davis, "Mathematical Logic and the Origin of Modern Computers," also in Vol. 26 *Studies in Mathematics*, pp. 137-165.

Watts S. Humphrey, "MOBIDIC and Fieldata," *Annals of the History of Computing*, 9 (1987):137-182. □