

CHARLES BABBAGE INSTITUTE NEWSLETTER

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THE CENTER FOR THE HISTORY OF INFORMATION PROCESSING

CBI Publishes New Guide

History of Computing Resources in the U.S. and Canada

Researchers and archivists searching for archival collections relating to the history of computing face a difficult task in locating sources. Traditional union guides and databases poorly represent the scope of resources that are currently available in archival repositories. CBI had attempted to meet that problem by acquiring finding aids and collection descriptions from other repositories, but the receipt of this information was sporadic and the material was difficult to use off-site. During the past two years CBI has increased its effort to assemble comprehensive collection information and will soon make available a publication titled, *Resources for the History of Computing: A Guide to U.S. and Canadian Records*.

The purpose of the guide is twofold. It will be a resource guide to researchers seeking information about archival collections relating to the history of computing. It will also be a guide for archivists interested in understanding the range of records that have been collected, and improving the documentation available for the history of computing. In this respect the guide is an essential element of CBI's National Collecting Strategy (see *CBI Newsletter* vol. 9, no. 2, Winter 1986).

Over 350 entries from academic, corporate, state, private and government repositories will be included. Most of these describe individual collections that focus on records relating to any and all developments and applications of the electronic computer, both digital and analog. Some entries outside the scope of electronic computers were included because they were relevant to computing in general. Most of the collections date after 1935.

The project surveyed as many likely sources of records as possible. In the case of academic repositories, it quickly became apparent that nearly every institution had some records relating to

computer center records. Therefore, the project focused on universities and colleges that were active developers of computers or computer applications, rather than users. The guide also is not intended as a general survey of records not already held by repositories. This distinction eliminated many valuable but difficult sources held by federal agencies in the United States and Canada. CBI hopes to investigate this area in the future.

The guide will be the first, single compilation of resources found at institutions with significant holdings relating to the history of computing. All pertinent collections included in the *National Union Catalog* and the RLIN database have been included. Repositories with a recognized commitment to the history of computing are well-reflected in the guide; collection-level descriptions have been submitted by the Computer Museum, Hagley Library, Harvard University, Library of Congress, Massachusetts Institute of Technology, Smithsonian Institution, Stanford University, University of Illinois, University of Pennsylvania, as well as the Charles Babbage Institute. Corporate collections also will be well-represented by Bell Canada, Control Data, Dataproducts, Hewlett-Packard, IBM, ITT, MITRE, Unisys, Texas Instruments, and others. In all, over seventy repositories already have contributed to the guide.

The guide will follow typical archival conventions. Each entry will include information about size, inclusive dates, local catalog numbers, a description, restrictions, and source of information. All entries have been submitted to the originating repository for verification. Arrangement will be by state or province and name of the repositories. Indexing will be provided. While the price of the

Project Historian Joins CBI Staff



Sheldon Hochheiser

Our last newsletter (vol. 9, no. 3, Spring 1987) described a new project CBI is undertaking on Documenting Industrial Activity for the History of Computing, with support from the National Historical Records and Publications Commission and the Control Data Corporation. In this project, CBI will employ the documentation strategy approach to probe three areas broadly representative of the development and application of the electronic digital computer. The three case studies will help us develop appraisal information for records in the computing industry, test the effectiveness of the approach for archivists involved in collecting industrial records, and assess the value of records available outside of the company as an alternative source of historical documentation. We are pleased to announce the appointment of Dr. Sheldon Hochheiser as Project Historian for this project.

Dr. Hochheiser brings excellent qualifications to the position. He received a bachelor's degree from Reed College in 1973 with an interdisciplinary major in history and chemistry, a master's degree

continued on page 5. . .

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Oral History Guide Update

Since the release last year of the *Guide to the Oral History Collection of the Charles Babbage Institute*, a number of interviews have been added to the collection and opened to research. The transcripts of all of the interviews described here are available on MS-DOS diskette. The *Guide* is still available from CBI for \$5.00 per copy.

Interviews listed in the 1986 guide that are now available for research use:

Oliver, Bernard M. OH 97 (only the first half was listed in the guide; see below for a complete description).

Cohen, Arnold A. OH 58.

The following are new interviews that were not included in the guide and are open to research:

Bauer, Friedrich L. Interview, February 17, 1987, in Munich, West Germany. Conducted by William Aspray. Audio cassette (1-60 min.). Transcript (19 pp.). OH 128.

Bauer begins with a brief discussion of his early life and education in Bavaria through his years in the German army during World War II. He discusses his education in mathematics and theoretical physics at the University of Munich through the completion of his Ph.D. in 1952. He explains how he first came in contact with work on modern computers through a seminar in graduate school and how he and Klaus Samelson were led to join the PERM group in 1952. Work on the hardware design and on compilers is mentioned. He then discusses the origins and design of the logic computer STANISLAUS, and his role in its development. The next section of the interview describes the European side of the development of ALGOL, including his work and that of Rutishauser, Samelson, and Bottenbrach. The interview concludes with a brief discussion of Bauer's work in numerical analysis in the 1950s and 1960s and his subsequent work in programming methodology.

Herr, Robert. Interview, May 19, 1987, in Minneapolis, MN. Conducted by Arthur L. Norberg. Audio cassettes (2-60 min.). Transcript (58 pp.). OH 111.

Herr reviews his family background and education at Haverford College, edu-

cation at the University of Minnesota in the 1930s, wartime activity, and his post-war work. During World War II Herr worked for the U.S. Navy's Bureau of Ordnance, primarily on methods of defending U.S. ships against magnetic mines. The bulk of the interview concerns his work starting in 1946 at Minnesota Mining and Manufacturing Company (3M) on magnetic tape development. After the introduction of magnetic tape in 1949, Herr started the Electrical Products Lab in 1952 at 3M, and later was vice president of the Data Recording Products Division. He also discusses 3M's relationship with Engineering Research Associates and Control Data Corporation.

Mullaney, Frank C. Interview, June 2, 1986, and June 11, 1986, in Minneapolis, MN. Conducted by Arthur L. Norberg. Audio cassettes (3-60 min.). Transcript (107 pp.). OH 110.

Mullaney begins by reviewing his family background and upbringing, early interests in ham radio, and his education in St. Paul public schools and the University of Minnesota. After earning his B. S. in electrical engineering in 1943, he worked for General Electric for a year and then for the U.S. Navy installing electronic equipment on ships. The bulk of the interview concerns his years at Engineering Research Associates (ERA) beginning in 1947. Mullaney was involved in several projects at ERA including the Goldberg project, Demon I, the ATLAS computer and was project engineer for the 1101 (the commercial version of the ATLAS). He discusses ERA's production technology and quality control efforts in the late 1940s and early 1950s. As an engineer on various projects, Mullaney witnessed ERA's transition from a designer of equipment for specific contracts to a designer of general-purpose equipment suitable for a range of problems. Mullaney continues by comparing and contrasting various ERA products including the ATLAS I and II, and the 1101, 1102, and 1103. He discusses the sale of ERA to Remington Rand, the differences and antagonism between the two companies, the departure of Mullaney, William Norris and others, and the formation of the Control Data Corporation. The last part of the interview focuses on the early years of Control Data. Many co-workers at

both ERA and CDC are mentioned, including Seymour Cray, who initiated Control Data's efforts to build a general purpose computer when Control Data was still exploring various market niches.

Oliver, Bernard M. Interview, August 9, 1985, and April 14, 1986, in Palo Alto, CA. Conducted by Arthur L. Norberg. Audio cassettes (4-60 min.). Transcript (111 pp.). OH 97.

The interview covers Oliver's early life, education, and work experiences at Bell Laboratories and Hewlett-Packard. Oliver began his formal education at California Institute of Technology at the age of fifteen and transferred to Stanford University for his junior and senior years to study electrical engineering with Frederick Terman. There he became associated with William Hewlett and David Packard. After receiving his degree in 1935 he returned to California Institute of Technology for graduate work, from which he joined Bell Laboratories in 1939. His initial assignment there was in the television research group under Axel Hansen. During World War II he worked at Bell on radar. Later he continued his work in television technology and worked with Claude Shannon on information theory. He discusses the organizational climate and objectives at Bell Laboratories in the 1940s and compares it to Hewlett-Packard, which he joined in 1950 as director of research. Many aspects of Hewlett-Packard are discussed: vertical integration, distribution of projects, company structure, competitors, associations with Stanford University, military contracts, the jet ink printer, product lines, marketing, research and development expenditures, foreign operations, and recruiting issues. Oliver also discusses his associations with William Hewlett, David Packard, and others at the corporation.

Schwarschild, Martin. Interview, November 18, 1986, in Princeton, NJ. Conducted by William Aspray. Audio cassettes (1-60 min.). Transcript (25 pp.). OH 124.

Schwarschild describes his early training in automatic computing when he assumed the position of director of the Watson Scientific Computation Laboratory at Columbia University upon the resignation of Wallace Eckert. Schwarschild describes the computa-

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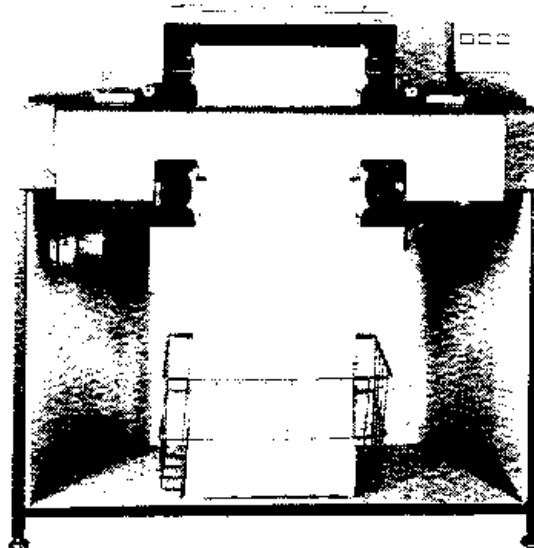
Selective Chronology of Printer Technology and Industry

This chronology lists selective key events in the development of computer printer technology and the emergence of an industry to develop, manufacture, and market this technology. The list is reasonably inclusive for the incipient period of development, which we consider to be the years through 1958. For the later years, the list is more selective. Only the first instance of a new type of printer product and its first major competition are listed for the modern period; subsequent products without major marketing or technological advances are not included. An effort has been made to include the founding dates of all companies of any general importance whose principal activity is in the computer printer field.

Information about advances in the printer field is not generally as widely available as information on the development of the hardware of the central processing or storage units, or on the development of systems software. CBI would appreciate hearing from individuals who have information or source materials on printers. Please contact CBI Research Assistant Robbin Clamons at the address or telephone number listed on the back cover.

- 1843 Georg Scheutz completes printing calculating machine
- 1867 Christopher Scholes and Carlos Glidden build typewriter
- 1870 Baudot code introduced
- 1935 IBM markets electric typewriter
- 1946 ENIAC punched card output used to run IBM printer
- 1948 Remington Rand introduces electric typewriter
- 1949 Telecomputing Corp. produces digital plotter
- 1949 North American Aviation introduces drum plotter
- 1950 California Computer Products founded
- 1950 Benson-Lehner Corporation modifies Dactylograph flat-bed plotter
- 1950 Electronic Associates adapts Analog Plotting Board
- 1950 SEAC punched paper tape output used to run Friden Flexowriter
- 1950 Hogan Laboratories develops electrolytic recorder
- 1950 Engineering Research Associates develops Magnetic Numeroscope printer
- 1952 Electronic Associates converts Analog Plotting Board to digital plotter
- 1951 UNIVAC magnetic tape output used to run Uniprinter typewriter
- 1951 Anelex Corporation completes Synchronprinter line printer
- 1951 Control Instrument Co. completes model of Wire Writer matrix printer
- 1952 Remington Rand introduces 600 lpm drum line printer for UNIVAC
- 1952 Potter Instruments introduces 300-900 lpm single wheel line printer
- 1952 Shepard Laboratories introduces model #100 line printer
- 1952 Atomic Instrument Co. develops thermal dot-matrix printer
- 1952 GE investigates ferromagnetographic printer
- 1952 Consolidated Vultee Aircraft develops Charactron xerographic printer
- 1952 Eastman Kodak introduces photoelectric and dot-matrix label printers
- 1954 Radiation Inc. founded
- 1956 Burroughs introduces dot-matrix electrostatic WHIPPET printer
- 1956 IBM introduces xerographic card and label printer

- 1957 IBM introduces dot-matrix line printer
- 1958 Anelex introduces multiple carbon heat transfer form printer
- 1958 NCR introduces thermal transfer printer
- 1958 Stromberg-Carlson introduces xerographic printer
- 1958 Universal Drafting Machine Corp. introduces digital plotter
- 1958 Gerber Scientific Instrument Co. introduces digital plotter



The First Dataproducts Printer, Serial No. 1.

The Dataproducts 3300 Line Printer was introduced in 1962 as the world's first moderately-priced commercial line printer. Innovations included the Mark I impact hammer and single cabinet construction. The first one was sold to Scientific Data Systems. The price was \$15,000. After a long working life of dependable service, it was bought by Dataproducts for retirement to a permanent place of honor on company premises. It still works, almost as well as it did in 1962.

- 1959 IBM introduces 1403 chain and train line printer for 1401
- 1959 A. B. Dick markets Videograph Printer-Plotter system
- 1959 Stromberg-Carlson offers video-photographic microfilm system
- 1962 Selectric mechanism used on STRETCH console printer
- 1961 IBM introduces Selectric mechanism
- 1961 General Dynamics plots from computer code
- 1962 Data Products founded (name later changed to Dataproducts)
- 1963 Data Products introduces low cost, low speed line printers
- 1963 Radiation Inc. builds page printer for Lawrence Radiation Laboratories
- 1963 R. G. Sweet develops ink-jet printer at Stanford University
- 1964 IBM offers 1403-N1 for System/360
- 1969 Viatron robot prints from computer via Selectric mechanism
- 1970 Band line printer introduced
- 1971 Telex introduces line printer
- 1972 Centronics introduces dot-matrix serial printer
- 1972 Diablo introduces daisy-wheel printer
- 1974 Honeywell introduces electrostatic page printer
- 1973 Xerox introduces 1200 xerographic page printer
- 1975 Sanders Technology Systems (Santec) founded
- 1975 IBM introduces 3800 laser printer for System/370
- 1977 Wang, Hewlett Packard and Siemens introduce laser printers
- 1976 Printronix ships dot-matrix line printers
- 1977 Xerox develops 9700 using laser scanning techniques
- 1978 Santec introduces letter quality dot-matrix printer
- 1979 Centronics offers 1000 lpm non-impact printer
- 1981 Qume introduces new daisy-wheel drive and microprocessor control
- 1982 Seiko Epson, Okidata, C. Itoh Electronics enter serial dot-matrix game
- 1982 Dataproducts offers daisy wheel printer
- 1985 Qume offers laser printer
- 1985 IBM offers Proprinter nine-wire serial dot matrix printer for PC □

A Report on the IBM Technical History Project

This article was prepared by Dr. Emerson W. Pugh, Manager of the IBM Technical History Project.

The IBM Technical History Project was begun in 1980 following a suggestion two years earlier by Emanuel R. Piore, former IBM vice president and chief scientist, to Frank T. Cary, then IBM chairman, that a book be written on IBM's technical history. Early in the discussions, the Thomas J. Watson Research Center in Yorktown Heights was selected as the project's home. Its excellent library, convenient access to corporate archives, and tradition of scholarly research were expected to provide an appropriate environment. It was also decided that the authors should have the technical background and experience to write with authority.

Charles J. Bashe, whose career with IBM began in 1949, was the first manager of the project. He had served in many engineering positions, including manager for the development of the company's first large-scale electronic computer for accounting applications, the IBM 702. By the end of 1980, two more individuals had been chosen to join Bashe in planning, researching, and writing the proposed book. The first was John H. Palmer, who had studied in Howard Aiken's computation laboratory at Harvard University before joining IBM in 1940 to work first in engineering and later in programming development. The second was Lyle R. Johnson, who had installed a UNIVAC in the Pentagon and an IBM 702 computer at the Ford Motor Company before joining IBM in 1958. At IBM, he held positions in research and on the corporate staff and served as editor of the *IBM Systems Journal*. I did not join the project until shortly before completing a book I had undertaken on my own, *Memories that Shaped an Industry—Decisions Leading to IBM System/360*. Published early in 1984, it became the first volume in the MIT Press Series in the History of Computing.

Two primary goals established for the Technical History Project's book were readability and accuracy in technical and historical content. Finding good evidence for all statements in the book—an essential element in satisfying the more



An IBM engineer checks one of the six magnetic core storage units of the STRETCH computer, built for the Los Alamos Scientific Laboratory. This 1961 photograph is from CBI's collection.

important of the two goals—was rather frustrating. The problem is that records were created and preserved for project management and business purposes, not for the benefit of historians. Documents frequently omitted critical information that everyone knew at the time, and many were discarded when no longer needed. The rapid growth of the company, with people and projects moving from old to new sites, added to the difficulties. Thus, although substantial use was made of the company's archival facilities, much of our information was obtained from individuals who had participated in the development programs. In addition to providing us with their recollections, many had saved important documents. Our freedom of access to these records and recollections ultimately permitted us to answer most of the questions we had the wisdom to ask. Personal recollections of individuals were invaluable in determining the tone of the times, the flow of events, and the roles of various individuals. But never did we rely on the recollections of a single individual for a significant event, and we insisted on having written records for key dates and technical facts.

The first tangible results of our effort was publication of *IBM's Early Computers* by the MIT Press in 1986. The size of the book may be intimidating to the reader,

but for the authors, it was barely adequate to tell a story of technical developments from approximately 1945 to 1962—a period in which IBM invested over 70,000 man-years in research and development. On average, 100 man-years of R&D effort are summarized in each of the 700 pages of the book. Clearly, only a small part of the information we obtained could finally be used. Deciding which development efforts and which individuals should be included was our most difficult task. Our objective was to provide as accurate and complete a portrayal of the era as possible in the limited space of the book. Shortly before *IBM's Early Computers* was published, C. J. Bashe retired, leaving Johnson, Palmer, and me to undertake a second volume devoted primarily to the development of IBM System/360.

Published books will be the most evident results of our efforts, but we have increasingly become aware of the importance of the references we have accumulated and the interviews we have made. These are being retained for use by us and future scholars. In charge of this activity is Caroline C. Coppola, the third person to join the project in 1980. Serving now as our publication specialist and archivist, she also continues to be responsible for all word-processing activities. □

Recent Publications

■ Michael Lindgren, *Glory and Failure: The Difference Engines of Johann Muller, Charles Babbage and Georg and Edward Scheutz*, (Linköping Studies in Arts and Science, Vol. 9, Kristianstads Boktryckeri AB, 1987).

A well-written study of the social context and technical developments of the work of this group of machine designers and builders.

■ David E. Lundstrom, *A Few Good Men From Univac*, (Cambridge, MA: MIT Press, 1987).

This history of events in the late 1950s and 1960s, by a participant in many of them, describes the backgrounds and activities of the men from Univac Division of Sperry Rand Corporation that took part in the early years of the Control Data Corporation.

■ Eileen Mahoney, "Negotiating the New Information Technology and National Development: The Role of the Intergovernmental Bureau for Informatics." Ph.D. Dissertation. Temple University, Philadelphia. May 1986.

The dissertation includes information on the history of the International Computation Centre, 1946-1961. The dissertation can be obtained from the author (School of Communications and Cognitive Science, Hampshire College, Amherst, MA 01002).

■ An Wang with Eugene Linden, *Lessons: An Autobiography* (Reading, MA: Addison-Wesley, 1986).

The autobiography of the founder of Wang Laboratories.

■ James Worthy, *William C. Norris: Portrait of a Maverick* (Cambridge, MA: Ballinger, 1987).

A biography of William C. Norris, one of the founders of Control Data Corporation.

■ *Annals of the History of Computing*, 9(1), 1987.

A special issue on the design and functioning of the Burroughs B5000, including a discussion in retrospect by many of the major participants in the development.

■ Recent articles of interest in the history of computing:

Herbert L. Anderson, "Metropolis, Monte Carlo, and the MANIAC," *Los Alamos Science* 14(Fall 1986):96-107.

Herbert L. Anderson, "Scientific Uses of MANIAC," *Journal of Statistical Physics* 43(1986):731-748.

John Hendry, "The Teashop Computer Manufacturer: J. Lyons, Leo and the Potential and Limits of High-Tech Diversification," *Business History* 29(1987):66-72.

T. Ivall, "Fifty years of computer science," *Electronics and Wireless World* 92(November 1986):52-62.

Manfred Kudlek, "The Historical Development of Formal Languages," (in Bulgarian) *Fiz.-Mat. Spis. Bulgar. Akad. Nauk.* 26(1984):190-195.

N. Joachim Lehmann, "Die analytische Maschine—Grundlagen einer Computer-Analytik," *Sitzungsber. Sachs. Akad. Wiss. Leipzig. Math.-Natur. Kl.* 118(1985), 64pp.

Fabrizio Luccio, "Beginnings of Concrete Algorithmics," (in Italian) *Boll. Un. Mat. Ital.* A3(1984), No. 3:57-80.

Wolfgang Mache, "Geheimschreiber," *Cryptologia*, 10(October 1986):230-247.

Allan R. Mackintosh, "The First Electronic Computer," *Physics Today* 40(March 1987):25-32.

A. F. Mayadas, "The evolution of printers and displays," *IBM Systems Journal* 25(1986):399-416.

Christopher Morris, "Ultra's Poor Relations," *Intelligence and National Security* 1(January 1986):111-122.

Seymour V. Pollack, "The Development of Computer Science," in S. Pollack, editor, *Studies in Computer Science* (Washington, DC: Mathematical Association of America, 1982), pp. 1-51.

Gordon Welchman, "From Polish Bomba to British Bombe: The Birth of Ultra," *Intelligence and National Security* 1(January 1986):71-110. □

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guide has not been set, interested individuals are welcome to contact CBI for further information. The guide should be ready for distribution by the beginning of fall.

Perhaps the most important message conveyed during the development of the guide is that the growth of resources for the history of computing is remarkably healthy. There is no lack of research-grade collections, though there is room for improvement. CBI hopes that the publication of the guide will increase active interest on the part of archivists and historians, and stimulate better documentation of the history of computing. □

CBI Sponsors Session at HSS/SHOT Annual Meetings

CBI is sponsoring a session on "Modern Computing Reexamined: Historical Investigations" at the joint annual meetings of the Society for the History of Technology and the History of Science Society. The meetings will be held in Raleigh, North Carolina, 29 October—1 November 1987.

Chair: Arthur L. Norberg (CBI)

Speakers:

I. Bernard Cohen (Harvard University) "Howard Aiken's Computers: Were New Ideas Encased in Traditional Technology?"

Arthur L. Norberg (CBI) "The Perils of Companies on Technological Frontiers: Designing and Manufacturing Electronic Computing Machines in the 1940s."

William Aspray (CBI) "The Computer as a Scientific Instrument: A New Climate for Meteorological Science and Practice."

Commentator: Michael S. Mahoney (Princeton University)

Please contact CBI if you have any further questions about this session or about the joint conference. □

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.

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continued from page 2. . .

tional research he did there on stellar models using advanced IBM tabulating equipment. Schwarschild next turns to his experience during World War II at Aberdeen Proving Grounds as an enlisted member of the army working on bomb blasts. He describes discussions among R. H. Kent, L. Dederick, IBM personnel, John von Neumann, and other scientific consultants on the design of new automatic calculating equipment for the laboratories. Schwarschild answers questions about the relationship between Kent and von Neumann. The final topic is the work during the 1950s that Schwarschild undertook on stellar interiors using the Institute for Advanced Study computer. He describes his experiences trying to use the computer for large scientific purposes, and recalls the reception of his computational research by the professional astronomy journals.

Thompson, Philip. Interview, December 5, 1986, in Boulder, CO. Conducted by William Aspray. Audio cassettes (2-60 min.). Transcript (39 pp.). OH 125.

Thompson describes his career in numerical meteorology. He discusses attitudes of the early 1940s, including those of Victor Starr and Jule Charney, towards the work of L. F. Richardson and the possibilities of predicting the weather numerically. He describes the Numerical Meteorology Project at the Institute for Advanced Study and the roles of Charney and John von Neumann in that project, partly from his first-hand experience there in 1946-47. Next he recounts the activities of the meteorology research group he organized at the Cambridge Air Force Research Center and the calculations they did in the early 1950s on electromechanical calculators and on an IBM 701. He describes the establishment of the Joint Numerical Weather Prediction Unit in Washington, and his work there from its founding in 1954 until 1958. Thompson discusses the U.S. Air Force research center he established in Sweden in association with the work being conducted at the Institute of Meteorology at the University of Stockholm. He then recalls how he left Stockholm in 1960 to become associate director of the National Center for Atmospheric Research. His interview concludes with some general comments about recent research in numerical meteorology and the revolutionary impact of the computer on meteorology.

Watson, Jr., Thomas J.; Birkenstock, James W. Interview, April 25, 1985, in Armonk, NY. Conducted by Arthur L. C. Humphreys. Audio cassette (1-60 min.). Transcript (13 pp.). OH 109.

Thomas J. Watson was chairman of IBM and James Birkenstock was a vice president of IBM, now retired. The British Tabulating Machine Company (BTM), was a licensee of IBM under an agreement made in the early 1900s and signed by Herman Hollerith, founder of the American Tabulating Machine Company, Ltd. The license agreement, among other things, gave BTM marketing rights for all of IBM's products in the British empire, excluding Canada. The agreement ended in 1949. Watson and Birkenstock discuss the circumstances surrounding the decision reached by Thomas J. Watson, Sr. and Raleigh Phillpotts, chairman of BTM, to end the original agreement between IBM and BTM. The interview covers the details of the original agreement, the relationship between IBM and BTM during World War II and after 1949, and IBM license agreements with Cyril Holland-Martin and Gerhard Dirks. □

continued from page 1. . .

in the history of science from the University of Wisconsin-Madison in 1975, and a Ph.D. from the same program in 1982. His doctoral dissertation was on "Synthetic Foods Colors in the United States: A History Under Regulation." From 1983 to 1985 Dr. Hochheiser was Corporate Historian at the Rohm and Haas Company of Philadelphia, where he conducted historical and archival research, including a number of oral histories, and published *Rohm and Haas: History of a Chemical Company* (Philadelphia: University of Pennsylvania Press, 1986). During academic year 1985-86 Dr. Hochheiser taught history in the Department of Science and Technology Studies at Rensselaer Polytechnic Institute. During academic year 1986-87 he taught in the Program in History of Science and Technology at the University of Minnesota. Dr. Hochheiser is active in the History of Science Society and the Society for the History of Technology and has published a number of articles on the history of food colors and food regulation. □

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CBI offers this special acknowledgment to the individuals listed below who support the programs of the Institute through their membership in the "Friends of CBI."

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