CHARLES BABBAGE INSTITUTE
NEWSLETTER
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CENTER FOR THE HISTORY OF INFORMATION PROCESSING

# Charles Babbage—200!*

## It Will Not Slice a Pineapple—The Construction of Charles Babbage's Difference Engine

*by Doron Swade, Senior Curator (Computing and Control), Science Museum, London*

The Science Museum has started the painstaking process of assembling Charles Babbage's Difference Engine No. 2 in public view. Babbage, a colorful and controversial nineteenth-century figure, is readily acknowledged as the earliest pioneer of automatic computing. Yet his image is clouded by failure. He failed to complete any of his extraordinary mechanical calculating engines, despite decades of design and engineering effort, substantial government support, private means, and the social advantages of a Victorian gentleman. Except for a few partial assemblies, these first attempts to build automatic calculating machines, the antecedents of the modern computer, were celebrated failures.

Contents



Almost all history books on computing ascribe Babbage's failure to limitations of nineteenth-century machine tool technology. The direct implication is that parts could not be made with sufficient precision for the machine to work when assembled. There is the subtler implication that Babbage's designs were too advanced to be realized in a mechanical medium at all. While there was disagreement as to whether there was any real need for his machines, there was little serious doubt in his day that the machines could be built. The highest authorities in the land as well as more than one Royal Society report attested to the feasibility of the attempt. Babbage's engines did stretch the state of the art in machine tool technology. But limitations of technology did not feature explicitly in the complex circumstances surrounding the abandonment, in 1834, of his major effort to build his machine—bitter disputes with his engineer, unconvincing progress after ten years, and flagging interest from government.

On the face of it, the supposed limitations of technology provide a credible account of Babbage's failure, but it is one that a growing body of scholars believes to be mistaken. We tend, especially where technology is concerned, to regard the past as crude. There is something self-congratulatory about this view that allows us, from the high ground of the

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*CBI—13

## Judy E. O'Neill, New Associate Director

In mid-January 1991 Judy E. O'Neill assumed her duties as Associate Director of CBI. The position of Associate Director is a wide-ranging one. O'Neill resumed full time an historical research program she started over a year and a half ago, which is related to the DARPA/IPTO study under way at CBI. We expect to complete this study in the summer of 1991. After that, O'Neill expects to expand her study of time-sharing and networking into a larger study of the government's influence in computer science, a particular interest of CBI. Simultaneously, she intends to develop other history projects on more recent topics in computer science and engineering.

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*Judy E. O'Neill*

*O'Neill continued from page 1. . .*

The administrative aspects of this post include the care and feeding of CBI in concert with the Director, policy development and evaluation, supervision of the research staff, consulting on collection development and appraisal of records, and liaison with the community of interest to CBI. O'Neill has aggressively assumed this latter role already. She has accepted the position of "Happenings" Editor for *Annals of the History of Computing* and serves as Chair of the Society for the History of Technology Special Interest Group on Information, Computing, and Society.

O'Neill completed her undergraduate education at Eastern Illinois University in 1978, receiving degrees in mathematics and computational mathematics in a program that emphasized computer programming with mathematical applications. Her formal education continued in an evening program in computer science at DePaul University, where she received an M.S. degree in 1981.

In 1979 she began her professional career as an applications programmer at the Northern Trust Company, a large bank in Chicago. Most of her applications programming experience there was in PL/1 using IMS on large IBM equipment and included both work on new system development and maintenance of existing banking applications. Before leaving the bank, she moved to the systems programming area where her responsibilities included operating system and compiler maintenance and troubleshooting.

At the end of 1981 she moved to the systems programming area of Land O'Lakes Inc. in Arden Hills, Minnesota. Here her duties included operating system maintenance and performance monitoring.

From 1983 through 1990 O'Neill worked at Cray Research, Inc. (CRI) as a software support analyst and software testing analyst for CRI communications products, which connect CRI computers with other vendors' computers, using both CRI proprietary and industry standard protocols. Her responsibilities at CRI included preparing and delivering technical presentations and classes, installing and customizing software at various customer sites, and debugging and field testing CRI communication products.

During this time at Cray, O'Neill pursued study for a Ph.D. in the Program in History of Science and Technology at the University of Minnesota. Her dissertation, which she expects to complete before the end of 1991, begins with an account of the technical developments of time-sharing and networking in the context of academic/government projects, from the mid-1950s to the mid-1970s. The specific issue of the extensive role of the government (especially military) in the development of new computing techniques is an important focus of the study. More generally, the social, political, and financial factors surrounding these technical developments will be discussed. This study includes an analysis of what these cases tell us about the interplay of government, industry, and academic institutions in the development of modern technology. □

CHARLES BABBAGE INSTITUTE
NEWSLETTER

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

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# Babbage—Faraday Bicentenary Conference

The Bicentenaries of the births of Charles Babbage and Michael Faraday fall in 1991 and this conference has been organized to discuss their lives and works. It will take place at Cambridge, England from 5–7 July, and it is organized by the Newcomen Society, the British Society for the History of Science, and the British Society for the History of Mathematics. Commemorative British postage stamps have been issued. A summary in chronological form of both men's lives will be available.

The provisional program on Babbage follows.

**Friday, 5 July 1991**

1430 I. Grattan-Guinness—The Analytical Society and Babbage's Mathematical Research
1530 M. Campbell-Kelly—Babbage's Mathematical Tables
1645 M. B. Hall—The Scientist in Society
1730 D. R. Carling—Babbage's Railway Dynamometer Cars
1745 M. T. Wright—Building the Difference Engine: Workshop Practice and Capability in Babbage's Day
1830 J. V. Connolly—Building the Difference Engine: The Engineer's View
2030 M. V. Wilkes—Babbage's Life and Personality

**Saturday, 6 July 1991**

0915 C. J. D. Roberts—Babbage's First Difference Engine
1000 D. Swade—The Construction of Babbage's Second Difference Engine
1115 A. Bromley—Babbage's Analytical Engine
1200 O. I. Franksen—Babbage's Cryptography □

# Babbage Celebration Events in England 1991

### Science Museum Builds 19th Century Computing Engine

Charles Babbage (1791–1871), the English mathematician, is the towering ancestral figure in the history of computing. His huge mechanical calculating engines have much in common with modern electronic computers designed over a century later.

Babbage failed to complete any of his extraordinary engines. The Science Museum in London is now constructing Babbage's full-sized Difference Engine No. 2 from original designs dating from 1847. Assembly of this monumental machine began in November 1990 in public view at the Science Museum. The engine consists of 4,000 parts, weighs 3 tons, and measures 10 feet long, 6 feet high, and 1.5 feet deep.

"It is widely believed that Babbage failed because of limitations of nineteenth-century machine tool technology," said Doron Swade, Curator of Computing at the Science Museum and Manager of the construction project. "By building a Babbage engine to original designs we have set out to prove that these machines could have worked in Babbage's day. We have a unique opportunity to redeem this great man in time for the 200th anniversary of his birth and rewrite history in the process," said Swade.

The total cost of building the engine and mounting a six-month exhibition is £500,000, raised from a consortium of computer, electronic, and communication companies. (See accompanying article on this project.) □

### Special Exhibition at the Science Museum 1 July 1991–January 1992

The Science Museum is mounting a special exhibition on Charles Babbage and his work. The centerpiece of the exhibition will be the first full-sized Babbage engine ever built. The Science Museum plans to unveil the engine for the first time at the opening of the exhibition on 1 July 1991.

In addition to the full-sized engine, the exhibition will feature the Science Museum's unrivaled collection of surviving Babbage pieces and selected items of unique archival material. Contemporary calculating machines on special loan from Sweden will also be exhibited for the first time in the United Kingdom. □

### International Conference on Computing, London, 1–3 July 1991

The bicentennial year provides a unique opportunity for a critical review of computer technology, the profession, and the industry. A major three-day conference, The Bicentennial Conference on Computing, is scheduled for 1–3 July 1991. The conference, under the auspices of the Institution of Electrical Engineers (IEE), will be held at Imperial College, London.

The conference program will assess the state of the art, the future, and, where appropriate, draw on the past. Speakers include seminal figures in the development of computer hardware, software, and the industry as well as eminent academics.

"The conference is a major event in the bicentennial calendar," said Professor Sir Eric Ash, Chairman of the Organizing Committee and Rector of Imperial College. "We shall take stock of four decades of intense activity in electronic computing and look to what the future holds for this extraordinary industry. The conference promises to be an illustrious event in itself," he continued. "The invited speakers are drawn from the most distinguished ranks of the profession worldwide." For more information contact:

Ms. Jane Chopping, Conference Organizer,
IEE
Savoy Place
London WC2R 0BL, England. □

### Babbage—Faraday Symposium, Cambridge, 5–7 July 1991

A two-day historical conference will be held at Cambridge under the auspices of the Newcomen Society. The program is devoted to the work of Charles Babbage and Michael Faraday. For more information contact:

Dr. J. M. Wheeler
131 Richmond Road
Cambridge, CB4 3PS
England. □

# Sammet Donates Papers

Jean E. Sammet, a leading figure in computer programming languages and professional organizations, with support from IBM's Federal Sector Division, has donated her papers to the Charles Babbage Institute. An initial shipment of 150 cubic feet of records was transferred last December, making the Sammet Papers the largest and one of the richest collections donated to CBI by an individual. This first shipment primarily contains records documenting Sammet's work in the computer industry, her work with computer professional groups, and the Ada programming language.

Sammet took early retirement from the IBM Corporation, which she joined in 1961 to organize and manage the Boston Programming Center, then part of the IBM Data Systems Division. There she conducted advanced development work in programming and produced the first FORMAC (FORmula MAnipulation Compiler), for which she received IBM's Outstanding Contribution Award in 1965. That same year she became Programming Language Technology Manager, which put her in the position to write *PROGRAMMING LANGUAGES: History and Fundamentals* (1969), regarded as a classic in computer literature. Research for this publication helped establish what is now perhaps the most comprehensive collection of manuals, technical reports, and other records relating to computer programming languages.

Between 1968 and 1978 Sammet held various positions in IBM involving planning, internal consulting, and lecturing on programming languages. In 1978 she became the divisional program manager for Ada, with responsibility for developing and coordinating the strategy and actions for IBM's Federal Systems Division (FSD) to begin using Ada. In 1979 she became Software Technology Manager for FSD and worked further on Ada and other language issues until 1983 when she returned to the position of Programming Language Technology Manager. Sammet retired early at the end of 1988 as a Senior Technical Staff Member and has turned to consulting, working on a second edition of her programming languages book, and continuing various professional society activities.

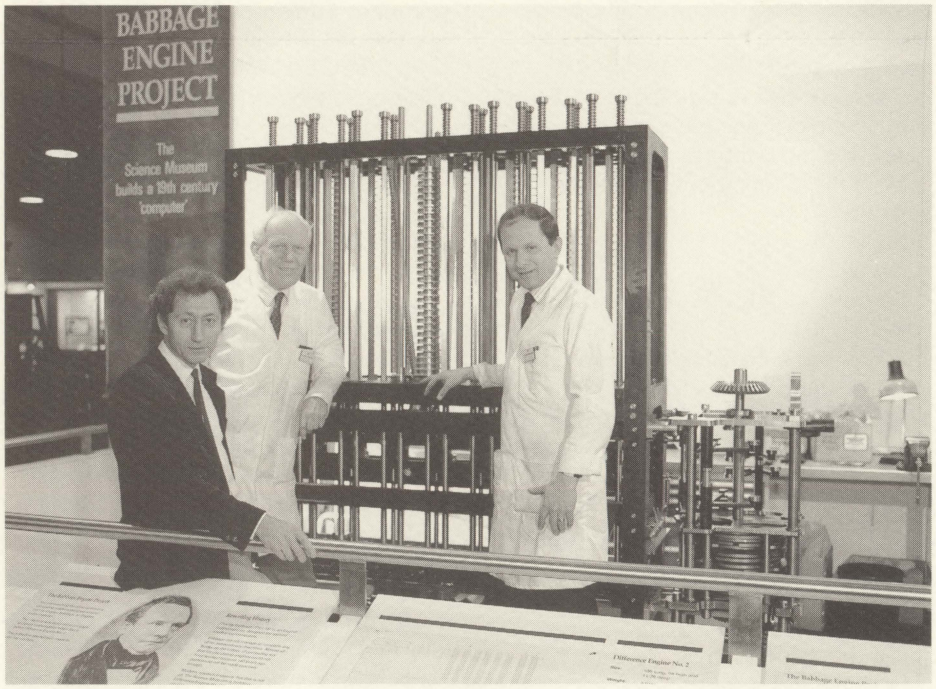
*Sammet continued on page 9. . .*

*Engine continued from page 1. . .*
electronic age, to patronize Babbage's cog-wheel world while paying tribute to his genius.

The Science Museum has set out to resolve the issue by building the first-ever complete Difference Engine in time for the 200th anniversary, in 1991, of Babbage's birth. The engine being built is monumental. It consists of some 4,000 individual parts, weights three tons, and measures 10 feet long, 6 feet high, and 1.5 feet deep. It is operated by a crank handle and is designed to find the value of a certain class of mathematical functions (seventh order polynomials) accurate to thirty decimal places—no mean feat even by modern standards. Most of the £290,000 cost of the engine has been pledged by a consortium of computer and electronics companies, which has also pledged funds towards the £207,000 for a special exhibition on Babbage scheduled to open on 1 July this year when the machine will be formally unveiled.

It is the Analytical Engine, Babbage's later machine, rather than the Difference Engine, that bears such a startling resemblance to the modern computer. The Analytical Engine was programmable, had a separate "store" and "mill," used punched card input and output, and had microprogramming and "pipelining" features. This engine was never completed, though two simplified partial assemblies were built and still survive. Constructing an Analytical Engine was too ambitious a project to undertake with any prospect of completion in time for the Bicentenary Celebrations this year, though judging by the crazed look in the eyes of the team building the Difference Engine we may not have heard the last of it.

The Difference Engine is more prosaic than the Analytical Engine but was nonetheless revolutionary. The basic element of the machine is an elegant mechanism for performing arithmetic addition. (See photographs.) This mechanism is repeated several hundred times, and the arrangement is a physical realization of the "method of finite differences"—a mathematical technique for calculating the value of functions using finite jumps. Babbage's designs for the Difference Engines were the first complete descriptions for an automatic calculator, that is to say, devices in which the computational rule is embodied in the machine and calculations are performed by physical exertion (turning a handle) without the need for mathematical expertise on the part of the operator.




*Difference Engine No. 2 Designed by Charles Babbage. View of the engine under construction in public view at the Science Museum of London. Pictured left to right are Doron Swade, Senior Curator, (Computing and Control), Head of the Babbage Project, Reg Crick, Engineer, and Barrie Holloway, Engineer.*

*The machine is made of bronze, steel, and cast iron and is operated by turning a winch by hand. The engine uses the method of finite differences to find the value of any 7th order polynomial to thirty decimal places and prints the result. (Science Museum photograph)*

The construction project is an ambitious one and raises a raft of technical, historical, and museuological issues. Historical authenticity plays a central role. The set of 20 design drawings for Difference Engine No. 2, drawn up in the late 1840s, survives intact. However, these are not sufficiently detailed to be of direct use to a modern workshop. The drawings do not specify dimensions, choice of materials, or tolerance, and a vast amount of research has gone into interpreting the designs so as not to compromise the overall historical purpose of the venture. Parts made by Babbage's engineer were analyzed using an electron microscope to find a close modern match for nineteenth-century gun-metal—the material Babbage used in his own attempt. Detailed measurements were taken to determine gear-tooth profiles and the precision achievable in Babbage's day. However, little effort has been made to use original tools or methods of manufacture, and unashamed use is being made of modern techniques and equipment. Numerically controlled machines, for example, are being used for the production of repeat parts. Despite this, scrupulous care has been taken to ensure that no part is made with greater precision than we know from measurement Babbage himself could have achieved.

The assembly of the machine is new and exciting territory. The 4,000 parts are being manufactured by some 47 specialist firms, and the finishing, fitting, and assembly are being conducted live in public view at the Science Museum. At the time of the collapse of Babbage's own construction project, some 12,000 parts for Difference Engine No. 1 had been made, though less than 10% of the machine was ever assembled. Thousands of carefully machined, unused parts were eventually melted down for scrap, though the completed section survives and works impeccably. The tantalizing and fascinating question remains: Did the sorry set of circumstances surrounding the abandonment of Babbage's project—disputes, problematic funding, long delays—conceal the technical impossibility of his dream?

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# The Friends of CBI

We would like you to become a Friend of the Charles Babbage Institute. The Charles Babbage Institute is dedicated to promoting the study of the history of information processing. By becoming a Friend of CBI, you can help support the activities of the Institute and learn more about the remarkable development and impact of information processing in society.

### CBI's Major Programs Areas

- **Historical Reasearch**—CBI specializes in researching historical areas of the information processing field. Topics have included development of the computer industry, scientific computation, the role of government in computing, and technical developments. The results of this research can be found in a series of popular and scholarly books and articles published by the CBI staff.

- **Archives**—CBI serves as an archival center in two ways. First, the Institute contains one of the largest collections of historical materials, which has been solicited from practitioners and organizations in the field. A public Reading Room is open regularly with professional staff available to help users. Our rapidly expanding collection of paper records includes corporate reports and internal company records, personal papers, special reports, periodicals, manuals, and technical reports.

  Second, Institute staff gather information about collections held in other repositories. One of the principal past means of acquiring this information was through a national survey of archival resources for the information processing field in both industrial and academic archives. The findings are reported in our "Resources for the History of Computing: A Guide to U. S. and Canadian Records," a publication that is revised periodically.

- **Oral Histories**—CBI has recorded oral interviews with over three hundred pioneering individuals in the information processing field.

- **Photographic Archives**—Our rapidly growing collection contains more than 3,000 photographs, including many of machines and people predating 1965. Photographs are our most heavily requested materials. Arrangements can be made in person or by telephone for reproduction of many of the prints and slides in the collection.

- **Graduate Fellowships**—CBI awards The Adelle and Erwin Tomash Fellowship in the History of Information Processing to graduate students whose dissertations address an aspect of the field's history.

- **Reprint Series**—Much of the historical work in the rapidly changing information processing field depends on the use of difficult-to-obtain monographs, conference proceedings, manuals, government reports, and books, issued in very small circulation numbers. The *Reprint Series*, available through CBI, brings into wider circulation these works, some being printed for the first time.

- **Publications**—Four times a year CBI produces this *Newsletter* of current activities at CBI and elsewhere relating to the history of information processing. The Institute also produces occasional papers such as bibliographies and finding aids.

- **Symposia**—CBI hosts and co-sponsors conferences and lectures in which we provide an historical perspective to contemporary issues surrounding the information processing field. Symposia are directed towards producers, users, public policy makers, archivists, academicians, and many others.

### Become a Friend

As an individual, you can associate yourself, along with hundreds of others, in the activities of CBI. There is a wide range of supporting categories, from Associate to Patron. Details of the Friends Program offerings are on the other side of this sheet, which is also a membership application form. Contributions to the Charles Babbage Institute are tax-exempt. We greatly appreciate matching contributions from companies that match employees' gifts. Thank you for considering becoming a **Friend of CBI**. □

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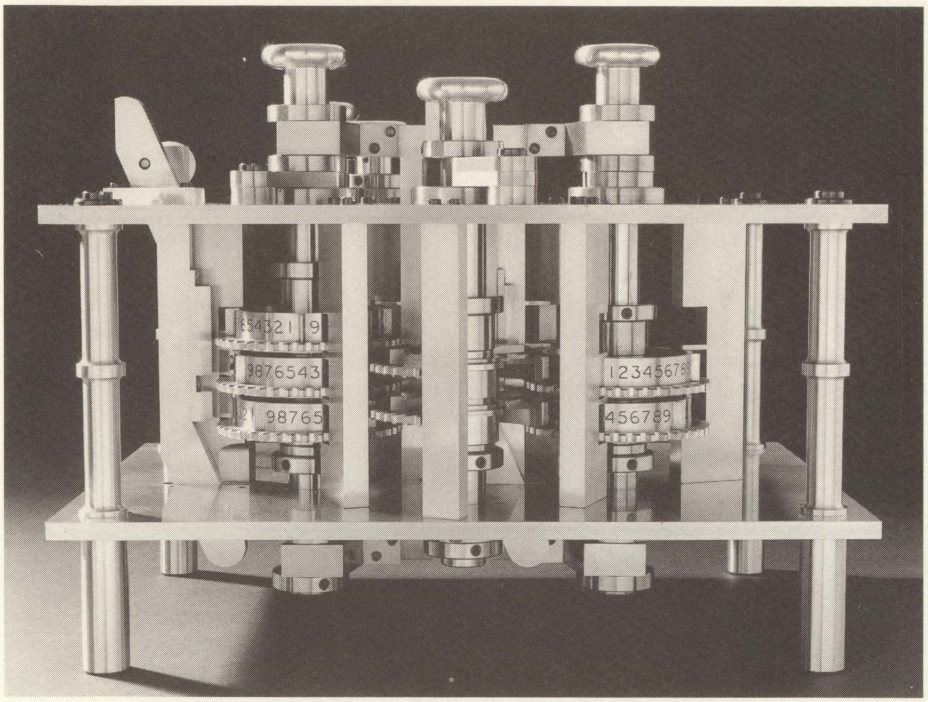

*Portion of Charles Babbage's Difference Engine No. 2. View of the trial piece of Babbage's DE2 built by the Science Museum. The portion shown was built by the Science Museum to Babbage's original designs as a trial piece to verify the basic logic and construction of the calculating mechanism. The trial piece measures 17 inches by 11.75 inches by 13.5 inches. It adds a two-digit number to a two-digit number, taking account of any carry. It is the first physical realization of any part of the engine. (Science Museum photograph)*

***Engine continued from page 4. . .***

The central trauma in Babbage's distinguished scientific life was the failure to realize a complete engine, and the lack of recognition for his work was a source of indignation and despair. There are many lessons in Babbage's struggles that find strong echoes today—the relationship between entrepreneurial ventures and government, advanced technology and innovation, market need, peer group evaluation, personal enmities, and the relationship of the inventor to the scientific establishment.

Babbage was less than complimentary about the cultural climate for entrepreneurs in England and had uncannily familiar views on the now celebrated allegation that Britain can innovate but, unlike America, is unable to exploit its inventiveness. As though just next door, Babbage wrote in 1852:

*England, though at present enjoying a very high state of prosperity, still shows some symptoms of a decaying nation. Propose to an Englishman any principle, or any instrument, however admirable, and you will observe that the whole effort of the English mind is directed to finding a difficulty, a defect, or an impossibility in it. If you speak to him of a machine for peeling a potato, he will pronounce it impossible: if you peel a potato with it before his eyes, he will declare it useless, because it will not slice a pineapple. Impart the same principle or show the same machine to an American, or to one of our colonists, and you will observe that the whole effort of his mind is to find some new application of the principle, some new use for the instrument.*

The 200th anniversary of Babbage's birth falls in 1991. In stark contrast to the lack of contemporary recognition, which so aggrieved him, a rich program of celebratory events is scheduled for the bicentennial year. Events include the unveiling of the complete Difference Engine, a special exhibition on Babbage at the Science Museum, an international conference on computing at Imperial College, London, an historical symposium in Cambridge on both Babbage and Michael Faraday, and special issue commemorative postage stamps. Babbage would surely be pleased. □

# Assessment and Review Committee of the (U.S.) Commission on Preservation and Access

In 1986 the (U.S.) Council on Library Resources established the Commission on Preservation and Access to serve as a catalyst to enable libraries, archives, and preservation specialists to expand and integrate existing preservation activities. The Commission was envisioned as a private, non-profit organization acting on behalf of the nation's libraries, archives, and universities to develop and encourage collaborative strategies for preserving and making available the increasing portions of our deteriorating published and documentary record.

After years of slow, dogged but important progress by a range of isolated organizations and individuals, preservation concerns exploded into a highly visible international movement. The ensuing transition of preservation activity from a cottage industry based on a philosophy of single-item salvation to the management of a comprehensive mass production strategy stimulated the recognition of a broad range of unprecedented choices and costly options. The availability of unprecedented federal and foundation funding as well as increasing support and interest at the state and local levels raised new questions and uncovered new needs.

In recognition of the significant changes caused by these new developments and the Commission's mission to serve a coordinating and catalytic function, the board established a review committee drawn from the Commission's primary constituency—the research library, scholarly, and higher education communities. The committee is charged to review the assumptions that underlie the creation of the Commission, to examine their validity in the current context, to assess the continuing role of the Commission in the broader context of preservation activities, and to recommend future directions and priorities. As part of the examination of these assumptions, the committee was charged to assess the progress in preservation in the

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# MIS History Project at Harvard

The Harvard Business School is sponsoring a historical project to gather evidence on the development of management and technical competencies that made a few firms clear leaders in the use of computer systems. The MIS History Project, begun in 1989, was created by Professor James McKenney and will produce a number of articles on the growth of the system and management teams related to specific computer applications. Ultimately the project hopes to present more comprehensive analysis in a book.

The project involves a number of questions relating to the use of computers in business: How was an information technology solution to a management problem identified, selected, infused, and absorbed into an organization? What was the original need? Who played the key executive role and technical roles and how were they played? How was the corporation in its role as a social and economic entity changed? And, finally, how were business practices and the basis for competition in the firm's industry changed?

These questions establish the basic approach to the inquiry and position the firm as the primary unit of analysis in the research. Thus the studies are not intended to trace a particular technology, social theme, or geographical area; rather, they follow the format of a corporate history. All of the studies have been restricted to the time period from World War II to the present.

Research for the studies has been undertaken by a team of researchers with experience in the field for the time under investigation. Source materials have come in four forms: (1) written, in the form of official documents, letters, memos, clippings, etc.; (2) material, in the form of objects, artifacts, and visits to actual sites; (3) traditional, in the form of stories of the past repeated by secondary sources; and (4) eye-witness testimony. All these sources have been used by the project team.

To date the MIS History Project has initiated studies in the following areas:

**SABRE**—Research initiated by James McKenney and Duncan Copeland on the airline reservation system has resulted in a number of interviews, such as those with Tom Cook, Frank Heinzmann, Max Hopper, and Dick Murray. The project has produced one article entitled, "Airline Reservations Systems: Lessons from History," (Copeland and McKenney, *MIS Quarterly*, September 1988).

**ERMA**—ERMA, an acronym for "Electronic Recording Machine–Accounting," established a system for the computerized sorting and delivery of checks. Research focused on ERMA has generated interviews of SRI engineers Bruce Clark, Bart Cox, Jack Goldberg, Fred Kamphoefner, and Stephen Miller; SRI employees Tom Morrin, Jerre Noe, and Oliver Whitby; and General Electric employees Bob Johnson, Clair Lasher, Jay Levinthal, and Joseph Weizenbaum. An article is being developed for *Annals of the History of Computing*.

**American Bankers Association**—The Association was primarily responsible for the adoption of a Magnetic Ink Character Recognition standard that made possible systems like ERMA. Interviews have been conducted with the majority of the ABA Technical Subcommittee on the Mechanization of Check Handling, including Herbert Corey, John Kley, Raymond Kolb, and Al Zipf. Interviews involving manufacturers have included IBM's Charlie Allen, Buck Rodgers, Charlie Smith, and Dan Spina and NCR's Richard Mindlin. An article on MICR is under way and likely to be published in *Business History Review*.

**Bank of America**—The growth and evolution of the Systems and Equipment Research Department parallels the pioneering use of computers at Bank of America. The story begins in the early 1950s with the beginnings of ERMA and the installation of an IBM 702. The research follows the team through the 1960s and the problems associated with the IBM 360 conversion. A host of interviews has been conducted with persons associated with Bank of America and IBM. An article following the department through the 1970s should be ready to be submitted for publication by spring.

**Airframe Design**—The next major industry study will be of the airframe design industry. In the early 1950s the cost and time of conducting calculations and producing drawings for ever more complex aircraft designs skyrocketed from 75,000 hours for an entire plane to the same amount of time for a single component such as an ejection seat. This situation presented major problems for the continued economic viability of the airframe industry. Interviews for this project are just beginning and so far have included Lee Amaya, Frank Wagoner, and Douglas Ross.

The History Project released its first occasional newsletter in December 1990 (from which most of the information in this article was obtained). For further information contact the project's research associate, Amy Weaver, at Baker 400, Harvard Business School, Boston, MA 02163. □

# UNIVAC Oral History Available

Last year the Unisys Corporation, in concert with the Charles Babbage Institute and the Smithsonian Institution, organized and supported a conference on the UNIVAC computer. (See *CBI Newsletter* Volume 12, No. 3, Spring 1990 for a description of the conference.) The transcript of those proceedings has been produced by CBI and distributed to the conference participants. It is available at CBI as part of its oral history collection (OH 200) and may be purchased in paper or machine-readable form.

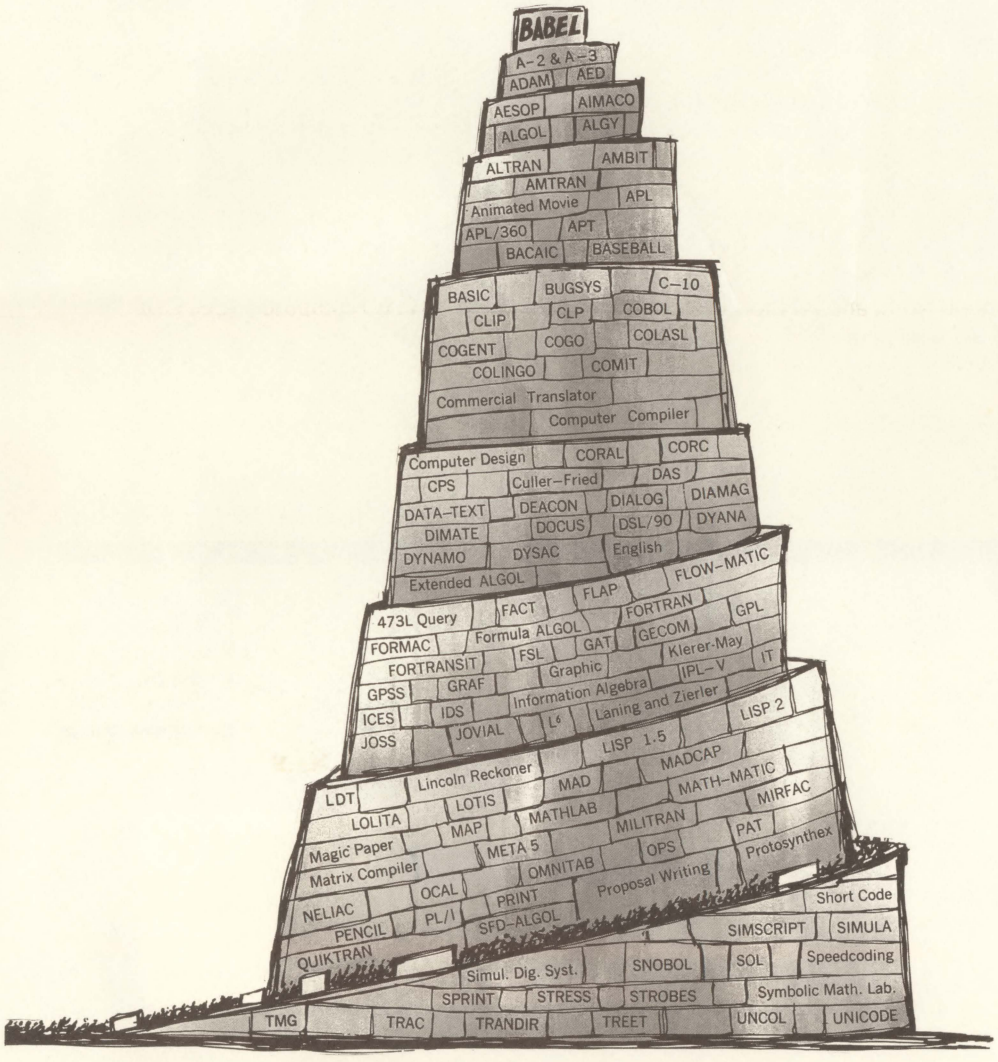
The conference focused on the UNIVAC from the period of 1952 to 1956 and covered topics relating to its development, marketing, application, technical aspects, and the individuals prominent in its history.

Inquiries about the conference should be directed to CBI's archivist. □

*Sammet continued from page 3. . .*

Sammet's papers reflect her work with IBM as well as earlier work at Sylvania Electric Products where she was initially responsible for software development for the Army's Mobile Digital Computer (MOBIDIC). There is nearly a continuous set of chronological files and subject files from the 1960s through the 1980s, including detailed descriptions of proposals and projects with which she was involved. Also, there are records relating to Sammet's participation in internal and external conferences and educational programs relating to programming. This scope of documentation provides a detailed perspective of the state of the industry in programming language development and management.

Sammet's expertise in programming languages led her to serve on a number of language and language standards committees. She was a key member of the group that first developed COBOL in 1959 and was a member of the CODASYL Language Structure Group from 1960 to 1964. She was a charter member of the USASI X3.4 Committee on Programming Languages and a member of the USASI X3.4.2 Committee on Language Specifications. More recently she served on Ada-related standards groups, including the original Ada Board organized by the Department of Defense. Most of her records relating to standards will be included in subsequent donations, although some Ada-related records in the collection are already available at CBI.




*The programming languages "Tower of Babel," which appeared on the front endpaper of Sammet's* PROGRAMMING LANGUAGES: History and Fundamentals *(Prentice-Hall, 1969)*

The other major component of this donation consists of files relating to Sammet's significant activity in computer professional societies, particularly the Association for Computing Machinery (ACM). She was ACM president from June 1974 to July 1986 and vice president for the two-year term before her presidency. She held various other positions including: organizing and chairing the ACM Special Interest Committee/Group on Symbolic and Algebraic Manipulation (SIGSAM), 1965–1968; serving as conference and program chair of the Symposium of Symbolic and Algebraic Manipulation, 1966; chairing the ACM Committee on Special Interest Groups and Committees, 1968–1970; chairing the ACM Special Interest Group on Programming Languages (SIGPLAN), 1971–1972; and serving as general and program chair for the ACM SIGPLAN History of Programming Languages Conference, 1978. From 1979 to 1987 she was editor-in-chief of *Computing Reviews* and the *ACM Guide to Computing Literature*. She was the first chair (1977–1979) of AFIPS' History of Computing Committee and in that capacity was involved in the initial planning for the Charles Babbage Institute. Her papers document most of the activities relating to these positions and include meticulous correspondence, reports, and memoranda.

While the collection is in good order, it must receive basic preservation treatment and some reorganization before a full inventory to the collection can be produced. Access to the collection is governed by certain restrictions, and interested researchers should consult the CBI archivist for further information.

In the coming years CBI plans to refine the organization of the papers in order to make the contents of the collection as accessible as possible. Subsequent donations will include technical records covering a full scope of programming languages and programming language standards, with as much as an additional 250 cubic feet of records. The Sammet Papers has added to CBI's substantial documentation of computer professional organizations and has made CBI's archival holdings on programming languages among the largest and most comprehensive available to researchers. CBI is grateful to Jean Sammet and the Federal Sector Division of IBM for making this important collection accessible to historians. □

# SHOT Special Interest Group in History of Computing Holds Fourth Annual Meeting

The Society for the History of Technology (SHOT) Special Interest Group in Information, Computing, and Society held its fourth annual meeting in Cleveland, Ohio on 19 October 1990. The meeting was chaired by David Allison of the National Museum of American History, Smithsonian Institution.

The group discussed and agreed with a SHOT proposal to add a fifth issue of *Technology and Culture*, to consist of the bibliography and reports from the Special Interest Groups. The assembled members then shared information about current projects and briefly discussed preparing a session for the 1991 joint meeting of SHOT and the History of Science Society. Judy O'Neill (CBI) agreed to become chair for the coming year.

Anyone wishing to become associated with this interest group can do so by writing to Judy O'Neill at CBI. □

*Review continued from page 7. . .*

nation over the past five years and assess the continuing need for preservation activities by identifying the major issues for the future.

Arthur Norberg accepted appointment to this four-member committee. The other three members are: William Schaefer, UCLA; David H. Stam, University Librarian, Syracuse University; and Yvonne Wulff, Assistant Director for Collection Management, University Library, University of Michigan. The group expects to complete its work some time in the summer of 1991. □

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