## CENTER FOR THE HISTORY OF INFORMATION PROCESSING

Aspray to be IEEE History Center Director

In May William Aspray accepted the directorship of the Institute of Electrical and Electronics Engineers (IEEE) Center for the History of Electrical Engineering. The Center, located at IEEE headquarters in New York City, promotes the study and understanding of the history of electrical science and technology among engineers, historians, and the general public. The programs of the center include archival and bibliographic services, oral history and documentation projects, exhibits, research, and publication. Dr. Aspray assumes his duties there in mid-summer.

Aspray's contributions to CBI over the past decade have been many and varied. *CBI Newsletter* readers will remember him as the first CBI Fellow (1978-1980). During his fellowship he completed his dissertation on Turing, von Neumann and the origins of computer science in mathematical logic. After CBI moved to the University of Minnesota, he spent some months here helping to organize the CBI program. He returned to CBI as
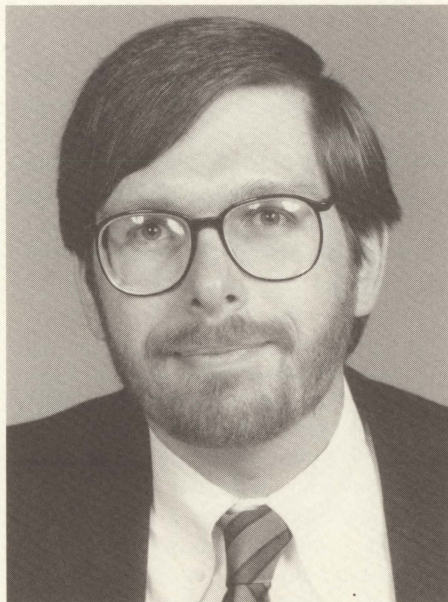
Dr. William Aspray

Business History Conference in Budapest

The International Management Center, Budapest, and the East European Program of The Wilson Center, Washington, D.C., co-sponsored a conference on "Comparative Enterprise Management: The Lessons of Business History" in June. The conference was attended by a small group of business historians and corporate representatives from the United States and an equal representation from East European countries.

The conference began with overviews of American and East European management primarily in the last thirty years and a session on small business. Then the participants turned to industry management
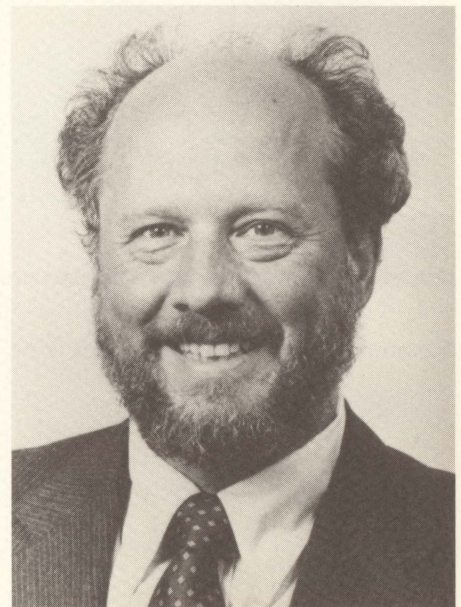
Traub Second CBI Lecturer

This fall the Charles Babbage Institute will present the Second CBI Lecturer.

On **16 October 1989 Dr. Joseph F. Traub** will speak on "What is Knowable?" at 4:00 p.m. in Room 3-210 Electrical Engineering/Computer Science Building, University of Minnesota, Minneapolis, Minnesota.

Joseph F. Traub is the Edwin Howard Armstrong Professor of Computer Science and Professor of Mathematics at Columbia University, New York. He was founding Chairman of the Computer Science Department at Columbia. From 1971 to 1979 he served as head of the Computer Science Department at Carnegie-Mellon University.

Starting in 1959, Dr. Traub pioneered research in what is now called computational complexity, the study of optimal algorithms for solving problems. In

Dr. Joseph F. Traub

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Associate Director in August of 1983 and served in that capacity with distinction. From January through April of 1989 Aspray was acting director of CBI.

In the past five years, Aspray pursued a substantial research program related to the history of computing and the history of mathematics. The results of this research program have appeared or will appear in a series of publications including a monograph on von Neumann and his contributions to computing, several edited volumes including essays by Aspray on a range of topics elaborating von Neumann's role in mathematics, the Princeton mathematics group in the 1930s, and developments in logic. The subjects of his articles in the field are quite broad. He has written on computing activities at the National Bureau of Standards, advertising the computer, the scientific and technological development of hardware and software, and the origins of the concept of information. While at CBI, he prepared several bibliographies on both the primary and secondary literature and wrote many popular articles to reach a general audience.

People far and wide have many reasons to thank Dr. Aspray for his indefatigable service reading manuscripts, offering

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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advice on research ideas and sources, arranging meetings and making introductions, and in general bringing cohesiveness to the community of scholars and interested persons in the field. In a more institutionalized way, he served as Reviews Editor for *Annals of the History of Computing* (1987-1989) and remains associate editor-in-chief of the CBI Reprint Series (1983-) and associate editor of the MIT Press History of Computing Series (1982-). He contributed a number of reviews to *Annals* and wrote several introductions to CBI Reprint Series volumes.

As Associate Director of CBI, Aspray oversaw a number of activities there. From the beginning he ran the fellowship program, hired and supervised the graduate student workers, worked closely with the archivist, Bruce Bruemmer, on projects in oral history, collection guides, collection development, and computing machinery and software selection. He often prepared pieces for this *Newsletter*. He participated in planning for CBI and conducted many of the screening interviews with researchers interested in using CBI collections.

Dr. Aspray has become a familiar face at conferences in the United States and Europe. He presented papers at international meetings in England, the Netherlands, and Hungary, visited projects in Austria, Switzerland, and West Germany, and conducted interviews with many of our European computing colleagues as part of activities of CBI.

In such a brief article we can offer only a flavor of Dr. Aspray's many accomplishments and his services to CBI and to the University of Minnesota. Staff members at CBI depended on him for many things. We will now have to learn to do these ourselves. Since we have become more than colleagues and are also friends, getting along without him will be difficult. But we believe this brief resume of his accomplishments amply demonstrates that he was an important member of CBI and will be a great director of the IEEE History Center. We thank him for all he has done for CBI and for each of us. We congratulate him on his new post. And we shed a tear at our loss. Good luck, Bill! □

recent years he has been working with colleagues on information-based complexity which studies the complexity of problems with partial and contaminated information. Such information is all that is available for many real-world problems. Of particular interest is the use of randomization to solve hard problems. He is the author or editor of eight books and more than eighty journal articles. He is founding editor of the *Journal of Complexity*, published by Academic Press.

Dr. Traub has received numerous honors including election to the National Academy of Engineering and Fellow of the American Association of Science.

He is Chairman of the Computer Science and Technology Board of the National Research Council, the operating arm of the National Academy of Sciences and the National Academy of Engineering. The Board produces studies on matters of national concern related to computers. Traub serves on the Board of Governors of the New York Academy of Sciences. He is an advisor to numerous institutions.

Please mark your calendar for **16 October 1989**. Plan to attend what promises to be a fascinating exposition on intractable problems, the possible use of randomization to break intractability, and the present state of our knowledge and ignorance. This lecture will be held in conjunction with the annual meeting of the Charles Babbage Foundation Trustees and Directors. □

Norberg to Edit Volume on Industry

The Encyclopedia of American Business History and Biography (EABH&B) is a multi-volume reference series. As an encyclopedia it must serve a cross-section of users: students, teachers, scholars, researchers, and government and corporate officials. Individual volumes or groups of volumes will cover a particular industry during a defined period; thus each EABH&B volume is free-standing, providing a history expressed primarily through biographies supplemented by a range of nonbiographical entries. Arthur Norberg, at the invitation of the general editor, Professor William H. Becker, and the publishers Bruccoli Clark Layman, agreed to edit a volume in the series on the computer industry.

A volume of the EABH&B consists of some 350 double-column pages (300,000 words plus illustrations). Biographies are the core of the work and will be supplemented as necessary by background entries on companies, inventions, legal decisions, marketing innovations, and other topics. The background entries will be integrated with the biographical entries in alphabetical order. Indexing is a key element in each volume.

The computer industry volume will contain a substantial overview essay on the origins and growth of the industry, including an analysis of the trends in the industry. The overview will contain descriptions of the industry primarily as supplier but with attention paid to its responses to demands from users. There will also be an essay on the science and technology of computing that will provide basic descriptions to help understanding of the industry trends. A brief analysis of the effects of various professional and trade organizations on the industry will be included. The purpose of these essays is to establish a context for the entries by providing a history of the field covered in each volume. The bulk of the volume will be devoted to biographical entries on companies and individuals. Entries will vary in size depending on the significance of the company and individual to the industry.

This volume of the *Encyclopedia of American Business History and Biography* should be available in July of 1991. □

review, concentrating on information systems, metallurgy, energy, automobiles, and agribusiness. Arthur Norberg discussed the information systems industry in the United States and P. Vadasz of Microsystem (Budapest) described the industry in East Europe. These two papers were followed by comments of Youri Atanassov, Software Products and Systems Corporation (Sofia), and Robert Peller, Computing Applications and Service Co. (Budapest). The conference ended with a roundtable discussion of the differences in the operating concepts for business in free market and socialist countries and of common problems. Ample time was available during the conference for discussion among the participants. □

Session at 1989 SHOT Meeting

Henry Lowood (Stanford University) and Arthur Norberg have arranged for a session at the October 1989 annual meeting of the Society for the History of Technology. The session is entitled "International Perspectives on the Role of Government in the Development of High-Technology Industry."

Papers will be delivered by John Peter Collett (University of Oslo) and Olav Wicken (Norwegian Institute for Defence Studies) on "The Many Roles of Government in the Norwegian Computer Industry;" by Arthur Norberg on "Military and Civilian Convergence on United States Goals for Development of Computer Systems in the 1960s;" and by Tom Wang (Dataquest, Inc.) on "The Silicon Road: Asian Industrial Policy for the Semiconductor Industry." Comments will be offered by Henry Lowood.

The meeting will take place on 12-15 October 1989 in Sacramento, California. Registration materials will be sent in due time to SHOT members. Others wishing to attend the meeting can obtain information from Jim Williams, California History Center, DeAnza College, 21250 Stevens Creek Boulevard, Cupertino, CA 95014 USA. □

Arthur Norberg (left) and Youri Atanassov, Vice President of Software Products and Systems, (Sophia, Bulgaria) listening intently to one of the Budapest Conference speakers.

CBI Chosen to Document NSF Computing History

The role of the U. S. federal government in the development of computing and the computer industry has been recognized by many but studied by few. The government is influential in this area as a regulator, a purchaser of vast quantities of equipment, and a supporter of basic research, development, and education.

Many different government agencies have played a role. The armed services supported the development of the first high-speed computers during and after World War II. The National Bureau of Standards carried out computer research and coordinated purchases for many government agencies in the decade following that war. The Atomic Energy Commission and the National Security Agency have been continuing purchasers of cutting-edge computer technology, leading to more rapid advances in areas like supercomputing. The courts and federal regulatory agencies have helped to set the framework for computer business, its international trade, and its standards. Over the past twenty-five years the Defense Advanced Research Projects Agency (DARPA), the National Institutes of Health (NIH), and the National Science Foundation (NSF) have provided numerous and substantial grants and contracts for basic research and some development.

CBI began last November its first major investigation of the government's role in computing with a two-year study of DARPA's Information Processing Techniques Office. (See *CBI Newsletter* Volume 11, No. 2 for details.) CBI is pleased to announce the beginning this June of a companion study, supported by the National Science Foundation for two years, of the contributions of NSF to computing and computer science. The simultaneous work on these two projects will allow us to draw comparisons between DARPA and NSF and more effectively understand the government's role in sponsoring basic research and development through the award of grants and contracts to the academic and industrial sectors.

The NSF study has four parts. It will begin with the preparation of a brief administrative history of NSF's several programs in computing in order to provide an overview of programs,

projects, personnel, and budgets. The second stage will be a more detailed examination of the programs. This will then be complemented by three in-depth case studies that include the areas of NSF support to institutions, computer science theory, and hardware or software. The study will conclude with the preparation of a book-length manuscript that reports the results of the first three steps of the project, assesses the impact on NSF's programs in computing, and compares its work with that of other government funding agencies such as DARPA and NIH.

CBI director Arthur Norberg will administer the program while CBI archivist Bruce Bruemmer will take responsibility for records surveying and identification. William Aspray will coordinate the research, prepare part of the study of programs and the case study on computer theory, and prepare the final manuscript. This work will be continued by Dr. Aspray in his new position at the IEEE, under a subcontract. Another subcontract has been awarded to Bernard Williams of Strategic Information Systems of Lawrence, Kansas to prepare the support history and the hardware or software case studies and to contribute to the final manuscript. Dr. Williams has written on computing in the federal government during World War II and has studied the history of computing in the post-war period.

This project is being carried out in coordination with the NSF Historian, George Mazuzan. □

Fourteenth Volume in Reprint Series

Volume 14 of the CBI Reprint Series for the History of Computing has been issued by MIT Press and Tomash Publishers. This volume, *The Early British Computer Conferences*, was edited and introduced by Michael R. Williams and Martin Campbell-Kelly. Proceedings of three conferences, held at England's most important computing centers between June 1949 and March 1953, are included: a Cambridge University conference on high speed automatic calculating machines (June 1949); Manchester University's conference to inaugurate the Ferranti Mark I (July 1951); and a meeting at the National Physical Laboratory on automatic digital computation (March 1953).

The attraction at the Cambridge conference was the EDSAC, in operation for only a few weeks at the time. Besides the focus on EDSAC, the proceedings contain a number of papers on coding, storage, and machine projects elsewhere. The Manchester conference was very similar, except that the focus was on the Ferranti Mark I. By the time of the next conference at NPL in 1953, the program structure reflects more organization in the field of computing. The organizers grouped the conference papers into thematic groups: British machines, programming, design, utilization, circuits, service, and other machines. Most of the papers constitute progress reports of projects.

Together with three other volumes in the series containing material from this same period—D. Hartree, *Calculating Instruments and Machines* (Vol. 6); A. M. Turing's ACE Report of 1946 and Other Papers (Vol. 10); and M. Wilkes, D. Wheeler, and S. Gill, *The Preparation of Programs for an Electronic Digital Computer* (Vol. 1)—we obtain a valuable perspective on the early days of British computing. We can also obtain insight into the nature and extent of the Anglo-American connections in these early days.

The volume is available through the MIT Press, 55 Hayward Street, Cambridge, MA 02142 U.S.A. or for Friends of CBI through the Babbage Institute. □

Recent Publications

- William Aspray, editor, *Computing Before Computers*. Ames, Iowa: Iowa State University Press, 1989. Essays by William Aspray, Allan Bromley, Martin Campbell-Kelly, Paul Ceruzzi, and Michael Williams.
- Alice R. Burks and Arthur W. Burks, *The First Electronic Computer: The Atanasoff Story*. Ann Arbor, Michigan: University of Michigan Press, 1989.
- Weldon B. Gibson, *SRI: The Take-Off Days*. Los Altos, California: Kaufmann, 1980.
- Rolf Hochhuth, *Alan Turing: Erzahlung*. Hamburg: Rowohlt Taschenbuch Verlag GmbH, 1987.
- Clark Mollenhoff, *Atanasoff: Forgotten Father of the Computer*. Ames, Iowa: Iowa State University Press, 1988.
- Vernon Pratt, *Thinking Machines: The Evolution of Artificial Intelligence*. New York: Blackwell, 1987.
- Amichai Silberman, "The Rise of the Digital Computer Technological Community in the U. S." Ph.D. dissertation, University of Wisconsin, Madison, 1986.
- M. R. Williams and Martin Campbell-Kelly, editors, *The Early British Computer Conferences*, Vol. 14, CBI Reprint Series for the History of Computing. Cambridge, Massachusetts: MIT Press; Los Angeles, California: Tomash Publishers, 1989.

Articles of Interest

William Aspray, "An Annotated Bibliography of Secondary Sources on the History of Software," *Annals of the History of Computing, 9* (1988):291-343.

Ralf Buelow, "Ein Unbekannter Computerpionier," *Kultur und Technik, 3* (1987):161-166.

Martin Campbell-Kelly, "Data Communications at the National Physical Laboratory (1965-1975), *Annals of the History of Computing, 9* (1988):221-247.

Martin Campbell-Kelly, "Charles Babbage's Table of Logarithms (1827)," *Annals of the History of Computing, 10* (1988):159-169.

Paul Ceruzzi, "Electronics Technology and Computer Science, 1940-1975: A Coevolution," *Annals of the History of Computing, 10* (1989):257-275.

I. B. Cohen, "Babbage and Aiken, With Notes on Henry Babbage's Gift to Harvard, and to Other Institutions, of a Portion of His Father's Difference Engine," *Annals of the History of Computing, 10* (1988): 171-193.

Communications of the ACM, 30 (1987) includes five articles in honor of the fortieth anniversary of the Association for Computing Machinery: Linda Feckzo, "Making Computer History for 40 Years," p. 849; Franz L. Alt, "Fifteen Years of ACM," pp. 850-857; Lee Revens, "The First 25 Years: ACM 1947-1962," pp. 860-865; Anita Cochran, "ACM: The Past 15 Years, 1972-1987," pp. 866-872; and Eric Weiss, "Commentaries on the Past 15 Years," pp. 880-883.

William F. Hawkins, "The First Calculating Machine (John Napier, 1617)," *Annals of the History of Computing, 10* (1988):37-51.

Robert A. Kowalski, "The Early Years of Logic Programming," *Communications of the ACM, 31* (1988):38-43.

Eda Kranakis, "Early Computers in the Netherlands," *CWI Quarterly* (Centrum voor Wiskunde en Informatica), *1* (1988):61-84.

Michael S. Mahoney, "The History of Computing in the History of Technology," *Annals of the History of Computing, 10* (1988);113-125.

John H. Maier, "Thirty Years of Computer Science Developments in the People's Republic of China: 1956-1985," *Annals of the History of Computing, 10* (1988):19-34.

Paul A. Medwick, "Douglas Hartree and Early Computations in Quantum Mechanics," *Annals of the History of Computing, 10* (1988):105-111.

M. Lynne Neufeld and Martha Cornog, "Database History: From Dinosaurs to Compact Discs," *Journal of the American Society for Information Science, 37* (1986):183-190.

Mina Rees, "The Computing Program of the Office of Naval Research," *Communications of the ACM, 30* (1987):832-848.

William F. Schmitt, "The UNIVAC Short Code," *Annals of the History of Computing, 10* (1988):7-18.

Richard E. Smith, "A Historical Overview of Computer Architecture," *Annals of the History of Computing, 10* (1989):277-303.

Michael R. Williams, "Babbage and Bowditch: A Transatlantic Connection," *Annals of the History of Computing, 9* (1988):283-290.

Erwin Tomash, "The Madrid Promptuary," *Annals of the History of Computing, 10* (1988):52-67. □

SAA to Carry High-Technology Guide

The High-Technology Company: A Historical Research and Archival Guide (see *CBI Newsletter* Volume 11, No. 3) will be sold solely by the Society of American Archivists (SAA).

After a review of this recent CBI publication, the SAA decided to include it on their publications list. All inquiries for orders should be directed to the SAA, 600 South Federal, Suite 504, Chicago, IL 60605 (telephone 312, 922-0140). □

CBI Archivist Elected to MAC and SAA Positions

Bruce H. Bruemmer, CBI's archivist, was recently elected to the Council of the Midwest Archives Conference (MAC) and the nominating committee of the Society of American Archivists (SAA).

The Council position is a two-year post in the nation's largest regional archival organization. Its six-person council determines fiscal, programmatic, and professional policies; establishes guidelines and reviews the work of committees; and oversees the operations of MAC.

The SAA nominating committee consists of three members who select a slate of candidates for next year's election of officers. □

Friends of CBI Membership Drive

This is an invitation to become a Friend of the Charles Babbage Institute. As a professional in today's world, you realize the importance of information processing in modern society. 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.

What is the CBI?

A **contemporary history center** that fosters research in and writing about the development of the field of information processing through the use of historical materials available at the Institute and at other repositories.

An **archival center** whose principal objective is to promote and to develop national collections of historically significant materials in the history of information processing.

A **resource center** for information about the location and contents of historical material and about persons interested in the history of information processing.

Why does the CBI exist?

We live in what is commonly referred to as the "Information Age," a period when information and the technology used in its accumulation and dissemination play increasingly important roles in modern society. The field of information processing, which was virtually unknown before World War II, has grown with breathtaking rapidity since then. The engines driving this change are the digital computer and electronic communications. Many believe these engines are having as dramatic and important an impact on the history of mankind as did the Agricultural and Industrial Revolutions.

Because the Information Age has developed in less than a single life-span, we have a truly unique opportunity to fully document its social, economic, and technical aspects. Firsthand accounts of the development of any human activity are among society's most precious and valuable records. The quality of our future understanding of any human endeavor depends crucially upon the availability of such information. But time is growing short to document the Information Age in this way. Many key pioneering individuals from the commercial, academic, government, industrial, and technical sectors of the information processing industry are still active and able to recount their contributions; but a significant number are elderly, and many have died. Now is the time to collect the knowledge and documentation these individuals and private and public institutions possess and to begin their analysis. CBI continues to lead the way in these activities.

What are CBI's major programs?

• **Historical Research**—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 are to 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 two 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. Thesis topics must be at least partly historical in nature and may include the economic and organizational milieu of developments in the field; legal or social aspects; or specific technical developments within the hardware or software fields.

• **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.

How can you support the activities of CBI?

As an individual, you can join hundreds of others in financially supporting all of the above activities by becoming a "Friend of CBI." There is a wide range of supporting categories, from Associate to Patron. Details of the Friends Program offerings are on the next 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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