CHARLES BABBAGE INSTITUTE
NEWSLETTER
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CENTER FOR THE HISTORY OF INFORMATION PROCESSING

Conference Explores UNIVAC History

Wide attention has been given to the introduction of the UNIVAC computer in the history of computing. The issues and sequence of events leading to the development of the UNIVAC have been covered in such writings as Nancy Stern's *From ENIAC to UNIVAC* and Herman Lukoff's *From Dits to Bits* and was the subject of AFIPS' 1981 Pioneer Day. However, less attention has been devoted to the place of the UNIVAC from approximately 1952 to 1956. A two-day oral history conference was convened in May to examine the role of the UNIVAC during this period.

Over twenty-five engineers, programmers, marketing representatives, and salesmen who were involved with the UNIVAC as well as customers who had worked with the machine attended the meeting. Many of these persons were key to the development and use of the computer, although this was the first time that most have been part of a historical analysis of the UNIVAC. Of particular note was the attendance of individuals from General Electric and Arthur Andersen, both firms having been early purchasers of the UNIVAC and influential in the sale of UNIVACs to other businesses. Also represented in the group was the U.S. Census, which purchased the first UNIVAC from Remington Rand.

The conference included three two-hour sessions held at the Smithsonian Institution's Ripley Center on 17 and 18 May. Bernard Galler (University of Michigan) and Robert Rosin (Enhanced Service Providers) moderated the first session, which concentrated on customers and sales. The second session covered technical issues and was led by Henry Tropp (Humboldt State University) and Robert Rosin. The third session

UNIVAC continued on page 2...

Arthur Norberg of CBI, Anne Frantilla of Unisys Corporation, and Paul Ceruzzi of the National Air and Space Museum at the UNIVAC Oral History Conference in Washington. Photograph by Jim Marks.

Contents

History and Sociology of Supercomputers

by Dr. Boelie Elzen, Centre for Study of Science, Technology and Society, University of Twente

Ever since digital computers were first constructed and gained increasing popularity, a small number of engineers aimed for greater performance of the computer. They put a continual effort into making machines that would outperform the ones "on the market" by factors of five or more. These machines, the fastest at any given time, are usually referred to as "supercomputers."

Trying to build ever faster computers may seem a "natural trajectory" in technological development, but there is a large threshold for building supercomputers: it takes on the order of five years to develop one—their development and production costs are very high. Currently it takes about $100 million to develop such a machine while it is sold for $10 to $20 million. Who, then, is willing to pay this amount of money for a computer?

Supercomputers continued on page 4...

UNIVAC continued from page 1. . .

began a general discussion of the data processing marketplace during the period that the UNIVAC was in production. Michael Mahoney (Princeton University) and Arthur Norberg (Charles Babbage Institute) led this session.

Each session included from nine to twelve persons with occasional participation from observers. The discussion encompassed familiar issues (such as the failure of Remington Rand's marketing) and new topics (such as the recruitment of data processing personnel, role of customers in shaping future sales of the UNIVAC).

All of the participants were treated to an after-hours' tour of the new Information Age exhibit in the National Museum of American History (NMAH), which features components of the UNIVAC and ENIAC computers. A dinner featured a number of anecdotes about the UNIVAC as remembered by the persons who had worked with the machine.

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Please let us know your new mailing address. This will ensure your receiving the *CBI Newsletter* on a timely basis and also save us postage costs. Thank you.

Unisys Corporation in concert with the Charles Babbage Institute and the Smithsonian Institution organized and supported the conference. Anne Frantilla, corporate archivist for Unisys, was responsible for developing the conference and bringing together the participants. The entire program was recorded, and Bruce Bruemmer, CBI's archivist, is engaged in preparing the transcript of the proceedings. The transcript will be distributed to the participants and made available to the public through CBI (as Oral History No. 200) and the NMAH Archives Center at the Smithsonian Institution. □

Paris Conference Held

The Second Colloquium on the History of Informatics in France occurred at the Conservatoire National des Arts et Metiers between 24 and 26 April 1990. Some 100 people participated in the conference, led by 44 speakers. A set of preprinted papers was distributed at the start of the conference, and speakers summarized their principal arguments. Many comments were offered from other participants.

The set of papers is an important mix of technical information on a number of machines and components developed in France, such as the Bull Gamma series, the microcomputer Micral N, and the SEA 3900 and 4000; discussions of applications in various French settings, from the insurance and banking industries to the railroad company; presentations of information about the rise of and changes in the French informatics industry; a few descriptions of machines and applications in university settings; and comparative studies of computing in Brazil, Great Britain, the Netherlands, Sweden, and the United States. The complete program follows.

"Les débuts de l'informatique au CEA (1952-1972)," A. Amouyal

"L'introduction de l'informatique à la SNCF: le Gamma 60 de Bull," R. de Fontgalland, directeur honoraire et R. Muller, ingénieur principal honoraire de la SNCF

"De la mécanographie au Gamma 60 à l'Institut National de la Langue Française," B. Quemada, directeur de l'INALF

"Les premiers ordinateurs au Crédit Lyonnais," M. Varenterghem, Inspection générale du Crédit Lyonnais

"L'informatique aux Mutuelles du Mans," M. Cosson, directeur général des Mutuelles du Mans

"Du Gamma 3 au Gamma E.T.: les premières machines électroniques Bull," B. Leclerc

"La Calculatrice Universelle Binaire de l'Armement (CUBA)," P. Naslin, ingénieur générale de l'armement

"Les techniques numériques et l'informatique à SACM et Alcatel," G. Dureau, ingénieur-conseil à Alcatel N.V.

"Les ensembles de gestion SEA 3900 et 4000," S. Herrström

"Le Micral de R2E, premier micro-ordinateur du monde," F. Gernelle

"Intertechnique et l'informatique," O. Darrieulat, étudiant, Université Paris-X

"Control Data Corporation, Simula-67 et Paris," J. André, IRISA-INRIA, Rennes

"Naissance du secteur des sociétés de services informatiques (1957-1975)," J. Carteron, PDG du groupe STERIA

"SEMA-METRA," J. Lesourne, président d'honneur de la SEMA, président du département dE'conomie et Gestion du CNAM

"STERIA: 20 ans de services," M. de Farran, directeur technique de la STERIA

"SAARI: 12 ans d'histoire," J. Guetta, PDG de la SAARI

"L'informatique à l'Université de Toulouse," M. Laborie, directeur de l'IRIT Toulouse III)

"Les débuts du traitement de texte: le système BBR," F.-H. Raymond, professeur honoraire au CNAM

"Une technique hybridge originale: un exemple de passage fructueux entre le calcul analogique et le calcul digital," B. Caussade (Toulouse) et G. Renard (Sophia Antipolis), directeurs de recherche au CNRS

"L'action de la DGRST en faveur de l'informatique (1959-1966)," G. Ramunni, chargé de recherche au CNRS

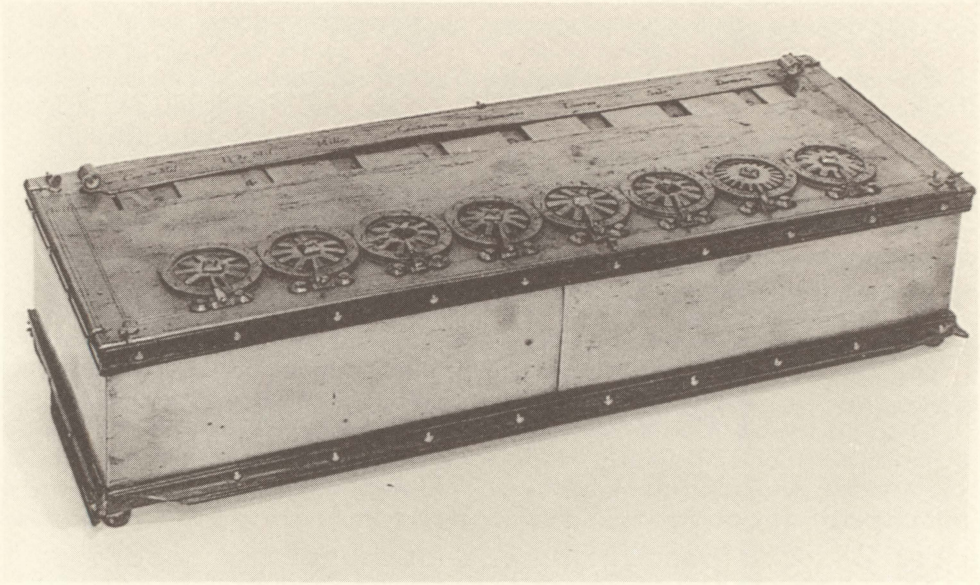
Conference continued on page 5. . .

Computing Machine Exhibition Opens at the Musee National des Techniques

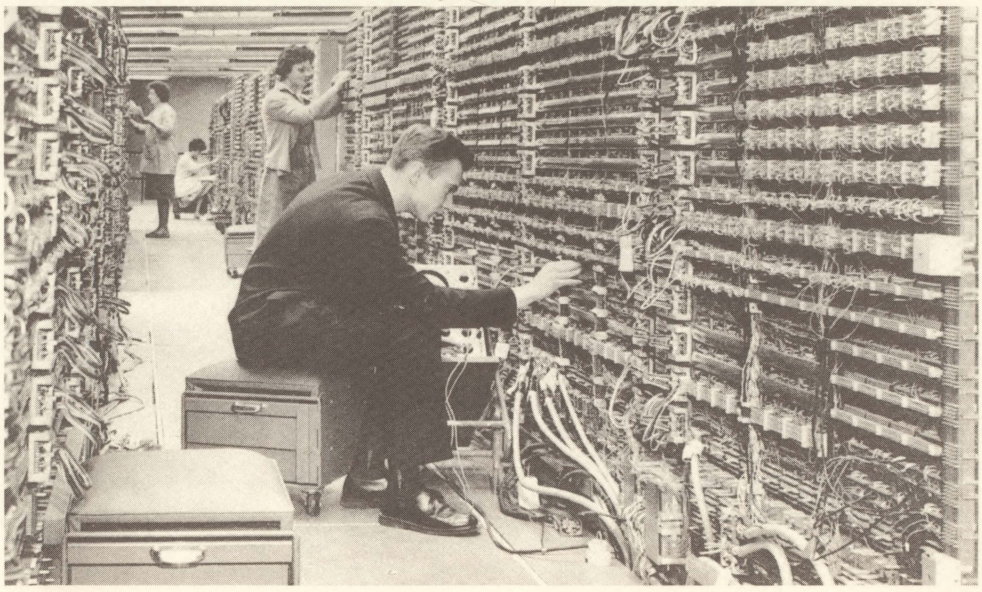
After several exhibitions organized for the bicentennial of the French Revolution, the Musee National des Techniques in Paris developed an exhibition honoring the 350th anniversary of the Pascaline, Blaise Pascal's calculating machine designed and built in 1640. The exhibition, "From Pascal's Machine to Electronic Automation, 350 Years of Computing," contains devices developed or used in France starting with the Pascaline, one of only a half-dozen extant examples, and ending with the Micral N, one of the world's first microcomputers, built by Francois Gernelle in 1972 and marketed in 1973. Among the other devices on display are Napier's rods, a de Colmar Arithmometer, a Hollerith system, Couffignal's machine (1950), the first electronic digital computer made in France, and the CAB 500 minicomputer, designed and marketed by Societe d'electronique et d'automatisme. The exhibition contains substantial information about how these machines operate and displays of components to show change over time—a total of 80 pieces and machines.

A second main feature of the exhibition is the interactive devices that make it possible for visitors to observe how the Pascaline works, learn to add with an abacus, multiply with Napier's rods, and multiply with an analog device. Microcomputer programs show how computers are built, the calculating methods used throughout history, and the specifications of the various machines exhibited.

The exhibition is at the Conservatoire National des Arts et Metiers, 292 rue Saint-Martin and will be on display through 23 September 1990. A catalogue of the exhibition, "De La Machine a Calculer de Pascal a l'Ordinateur," is available from the Musee. □



The CNAM Exhibit begins with one of the few surviving examples of the Pascaline, designed by Pascal in 1640.



The Exhibit has a number of examples of French-designed digital computers. This photograph shows a Bull Gamma 60.

Supercomputers continued from page 1. . .

Until recently, supercomputers found their way to a limited number of users and no more than a couple dozen of each of them were sold. Some prime users were weather bureaus, U.S. nuclear weapons laboratories, the U.S. National Security Agency, and a small number of large scientific institutions. This picture, however, started to change in the 1980s when a more anonymous market developed. An increasing number of business corporations also became interested and started buying supercomputers. These include petroleum companies, using them for seismic analysis in order to find new oil deposits, and automotive companies that use them, for example, to simulate car crashes that would be much more expensive to carry out in "real life."

At first glance it may seem that the development of supercomputers is primarily a way of "pushing technology toward its edge." Indeed, many of the engineers involved speak of their activities this way. However, these engineers are continually faced with choices that are often incompatible. Choices may include a "gamble" on the chips that will be available in four years, the type of architecture to be used, the size of memory, the number of processors, the type of software, etc. These choices to a large extent determine the performance and specialization of a machine, making it more suitable for certain applications rather than for others. From the standpoint of the users, this makes it important to have some influence on the design process to make sure the next generation of a machine will better fill their needs. The process of developing supercomputers, therefore, is not simply a matter of making a machine, bringing it to the market, and then selling it. During the development process a continual interaction is going on between the manufacturer and the (anticipated) user, and this interaction partly shapes the machine.

In our project on the history and sociology of supercomputers, we will study the various interactions between the technological and the social side of the development of supercomputers over the past three decades. Machines developed in these years include the CDC-6600 and CDC-6700, STAR-100, CYBER-205, and a number of CRAY machines. Our sociological interest makes us try to understand how, on the one hand, the interactions between the various social actors (e.g., users and designers) influenced the design of the various machines, as well as how, on the other hand, new machines influenced social interactions, for instance by opening up new markets.

The project is carried out at the University of Edinburgh, Scotland by Boelie Elzen and Donald MacKenzie. Funding is provided by the UK Economic and Social Research Council's Programme on Information and Communication Technologies. In April and May 1990 a large number of interviews was carried out in the United States. During this work the Charles Babbage Institute was used as a home base. The resources of the Institute were instrumental in locating and contacting various people in the field of supercomputers while the Institute's archives provided a valuable source of information for learning more about the background of (super) computing.

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Perlis Papers Donated to CBI

The papers of the late Dr. Alan J. Perlis were donated to CBI this spring by his wife, Sydelle. Dr. Perlis was among the country's most prominent computer scientists, having been instrumental in establishing a computer center at Purdue and the Computer Science Department at the Carnegie Institute of Technology (now Carnegie-Mellon University). He joined the Department of Computer Science at Yale University in 1971. His career included research on programming and programming languages, and he was a past president of the ACM and the first editor of *Communications of the ACM*. His papers include recent documents relating to his teaching, as well as writings, publications, audio recordings, and photographs. The picture below was among the photographic prints donated to CBI. It was taken during Perlis' tenure at Carnegie Tech. For further information about the papers, please contact the CBI archivist. □

Dr. Alan J. Perlis

Smithsonian Opens Exhibition on the Information Age

The Smithsonian Institution's new exhibition, "Information Age: People, Information and Technology," opened 9 May at the National Museum of American History in Washington, D. C. The exhibition allows visitors to explore how information technology has changed our society over the last 150 years. It approaches the subject from both historical and contemporary viewpoints, starting with the invention of the telegraph in the 1830s and continuing to the present. There are more than 700 objects and 700 graphics in the exhibition; visitors may stop at more than 40 stations for hands-on use of computers and sophisticated interactive equipment.

The exhibition contains a complete computer network that ties together the interactive workstations, video, films, and radio recordings in the exhibit hall. As the visitor enters the exhibition, she receives a brochure that outlines the exhibit and includes a map and list of major interactive stations. The visitor interacts with the displays by waving the unique bar code on each brochure. Logged activities are stored on the exhibition's computer network. Visitors can each receive a printout of these activities when they reach the interactive gallery at the end of the exhibition. The printout might have, for example, the visitor's age bracket, sex, and hometown region; her opinions on TV and politics; a fingerprint analysis; her reactions at the emergency "911" station; and her opinions on the exhibition itself.

The displays are found in three sections. The exhibition begins with the period 1835–1939. One can view various information processing devices, for example, office, stock market, census taking, horse-racing odds making, and mail order equipment, and the development of instantaneous communications—the wireless, telephone, and radio.

The visitor can then move through a section on "World War II: The Information War, 1940–1945," where she can learn about the strategic importance of a Combat Information Center and code breaking. The highlights of this section are a re-creation of a Combat Information Center, original artifacts relating to ENIGMA, and a filmed interview with J. Presper Eckert.

The largest section of display is on "People, Information, and Technology, 1946–Present." Divided into four parts, visitors learn first about the early development of computers and the computer business, see some of the large, early computers, and view some aspects of the development of transistor technology. Part two shows how computers entered the mainstream of life, notably in such areas as banking, airline reservations, and retail sales. The visitor also sees how electrical communications became interlinked with computers and moved across new information highways such as satellite links and microwave bands. The remaining two parts focus on robotics and networks.

A multimedia presentation using the latest video technology (shown as a video wall consisting of twelve high-resolution projection cubes) greets the visitor at the end of the exhibit space. Here people can think back over what is in the exhibition and consider how all this technology has affected their lives. This presentation is adjacent to a gallery containing a number of interactive devices. Visitors can experiment with computer voice recognition, devise a new type of bicycle using computer-aided design as well as try to run the bicycle company, and sample several on-line databases. The Smithsonian intends to change these interactive programs periodically to keep up with the most current technologies.

This exhibition was a major undertaking, led by David K. Allison, curator in the Museum's Division of Computers, Information, and Society. He was assisted in this exhibition by Jon Eklund, Bernard Finn, both well known for earlier exhibitions in related areas, and Steven Lubar, who recently led work on an exhibition of 19th century technology. Support for the exhibition came from a wide array of companies in the computer and communications industries. The exhibition is in the category of "permanent" exhibitions and so will be available for viewing for some time into the future. □

Conference continued from page 2. . .

"Le CNET et l'informatique," C. Bertho-Lavenir, maître de conferences au CNAM, et A. Profit, président d'Intelmatique

"Aux origines de l'affaire Bull: la Compagnie des Machines Bull et les milieux scientifiques," P.-E. Mounier-Kuhn, CNRS et Centre STS-CNAM

"From Invention to Production: The Development of Punched-card Machines," by Fr. R. Bull and K. A. Knutsen (1918-1930), L. Heide, Université d'Odensee

"Before the 'Logabax': The Design and Machines of Francisco Campos," R. Bülow, Deutsches Museum, Munich

"Early Computers in the Netherlands," E. Kranakis, Université d'Amsterdam

"ICL and the British Computer Industry," M. Campbell-Kelly, Université de Warwick (Coventry)

"Selling Computers: The Experience of Ferranti Ltd.," G. Tweedale, Université de Manchester

"Le calcul et l'informatique en Suéde," S. Herrström

"The U. S. Computer Printer Industry," E. Tomash, président de Dataproducts Corporation

"The Computer Industry in the United States: Past and Present Trends," A. L. Norberg, directeur du Charles Babbage Institute, Université du Minnesota

"Le transfert de technologie dans l'informatique soviétique, rôle particulier de Bull," Y. Logé, Fédération des Équipes Bull

"The Remington-Rand Computer of 1946 and the Development of the American Computer Industry," C. Burke, Université du Maryland

"The Development of Analogue Computing in America and Britain (1940-1975)," J. Small, Université de Manchester

"L'État et la construction politique de l'informatique en France et au Brésil," A. J. Botelho, chercheur au MIT (programme STS)

A revised set of papers will be published (in French) as the proceedings of the conference, under the editorship of the organizer, Pierre E. Mounier-Kuhn. □

Recent Publications

- Alain Beltran and Pascal Griset, *Histoire des techniques aux XIX^e et XX^e siecles*. Paris: Armand Colin, 1990. (Over one-quarter of this work is on information technology.)
- Bruce I. Blum and Karen Duncan, editors, A History of Medical Informatics. New York: ACM Press, 1990.
- Martin Campbell-Kelly, *ICL: A Business and Technical History*. Oxford: Oxford University Press, 1989.
- Paul E. Ceruzzi, *Beyond the Limits: Flight Enters the Computer Age*. Cambridge, MA: MIT, 1989.
- James W. Cortada, *Archives of Data-Processing History*. Westport, CT: Greenwood, 1990. (A series of essays on federal government, museum, university, and corporate archival collections by the principal archivists in the field.)
- Mary Croarken, *Early Scientific Computing in Britain*. Oxford: Oxford University Press, 1990.
- John Hendry, *Innovating for Failure: Government Policy and the Early British Computer Industry*. Cambridge, MA: MIT, 1990.
- Musee National des Techniques, *De La Machine a Calculer de Pascal a L'Ordinateur*. Paris: Musee, 1990.
- Stephen Nash, *A History of Scientific Computing*. New York: ACM Press, 1990.
- Brian Oakley and Kenneth Owen, *Alvey: Britain's Strategic Computing Initiative*. Cambridge, MA: MIT, 1990.

Articles of Interest

William Aspray and Michael Gunderloy, "Early Computing and Numerical Analysis at the National Bureau of Standards," *Annals of the History of Computing 11* (1989):3–12.

F. L. Bauer, "The Cellar Principle of State Transition and Storage Allocation," *Annals of the History of Computing, 12* (1990): 41–49.

Louise S. Grinstein and Rina Yarmish, "Selected Published Work of Henriette Davidson Avram: An Annotated Bibliography," *Information Technology and Libraries, 9* (1990):7–32.

William J. Jones, "MGDPS and DS-DPS—Two Stages of an Early Operating System," *Annals of the History of Computing, 11* (1989):99–108.

Peggy Aldrich Kidwell, "American Scientists and Calculating Machines—From Novelty to Commonplace," *Annals of the History of Computing, 2* (1990):31–40.

Manfred Mohring, "Wilhelm Schickard: Erfinder der ersten mechanischen Rechenmaschine (1623)," *Wissenschaft und fortschritt, 38* (1988):248–51.

Montgomery Phister, Jr., "Quotron II: An Early Multiprogrammed Multiprocesor for the Communication of Stock Market Data," *Annals of the History of Computing, 11* (1989):109–126.

James E. Rush, "Computer Hardware and Software in Chemical Information Processing" [1945-1990], *Journal of Chemical Information and Computer Sciences, 25* (1985):140–49.

Special Issue: "The Computer and the Brain: An International Symposium in Commemoration of John von Neumann (1903-1957)" (held in 1987 at Arizona State University), *Annals of the History of Computing, 11.3* (1989).

Special Issue: "History of Computing in France," *Annals of the History of Computing, 11.4* (1989).

Special Issue: "History of Computing in France—Machines," *Annals of the History of Computing, 12.1* (1990).

James C. Williams, "The Rise of Silicon Valley," *Invention & Technology*, 6 (Spring/Summer 1990):18–24. □

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