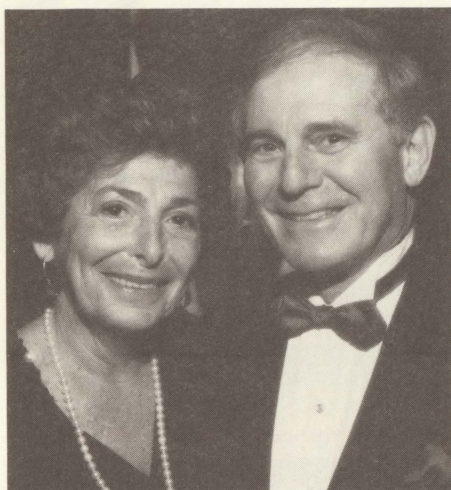## THE CENTER FOR THE HISTORY OF INFORMATION PROCESSING

CBI Fellowship Renamed

The Adelle and Erwin Tomash Fellowship in the History of Information Processing

Adelle and Erwin Tomash

This year is the tenth anniversary of the founding of the Charles Babbage Institute and Foundation. It was in April 1978 that Erwin Tomash called a meeting in New York City of a group of people interested in the history of the computing enterprise. CBI, to honor the many contributions to the work of CBI and CBF, has renamed the CBI Fellowship the Adelle and Erwin Tomash Fellowship in the History of Information Processing. It was the Tomashes who launched CBI with a substantial gift. Through its early years they were the guiding force behind the fundraising that allowed the program to expand. As chairman, Erwin oversaw the formation of policy for both groups, CBI and CBF, and kept the organization from foundering on the shoals of too many tasks for too few personnel. As secretary, Adelle attended to those details that preserve the legal structure of an organization.

To further enhance the reputation of CBI, they became the guardian angels behind the CBI Reprint Series for the History of Computing. CBI reaps the benefits of this series without bearing any of the cost. Most recently, the Tomashes offered a challenge grant to aid in the raising of endowment funds for CBF, a challenge to which many others connected with CBF responded in full measure. And when the University of Minnesota initiated its Capital Campaign, the Tomashes made yet another substantial gift. The return from this gift will be used in perpetuity for CBI. It was at the New York City meeting ten years ago that the Fellowship was conceived. Erwin Tomash saw to it that the fellowship was established quickly to help increase the number of "workers in the vineyard." The fellowship program has been very fruitful. So it is our pleasure at this time to rename this most productive aspect of CBI's program the Adelle and Erwin Tomash Fellowship in the History of Information Processing. For us, this is a fitting tribute to the two people who have so selflessly supported the work of CBI and CBF. □

Fellowship Recipients Continue to Contribute to the Study of the History of Information Processing.

The fellowship program was founded with the purpose of attracting serious, competent scholars to the history of information processing and advancing their professional development. Since the program's inception in 1978 the fellowship has been awarded ten times to seven individuals. A review of the activities of post and current fellowship holders reveals the wide range of scholarly activities the program has fostered.

William Aspray, 1978-79 and 1979-80 fellowship recipient. W. Aspray received his Ph.D. from the University of Wisconsin, Madison, in 1980. His dissertation title was, "From Mathematical Constructivity to Computer Science: Alan Turing, John von Neumann and the Origins of Computer Science in Mathematical Logic."

Positions held: 1980-82 Williams College, mathematical science department, assistant professor; 1982-83 Harvard University, history of science department, lecturer; 1983-present University of Minnesota, Charles Babbage Institute, associate director.

Research interests: John von Neumann, scientific computation, international diffusion of computer technology, theory of computing, historiography.

Selected publications in the history of computing:
"Literature and Institutions in the History of Computing," *Isis* (April 1984).
co-author (with B. Bruemmer) "Guide to the Oral History collection of the Charles Babbage Institute," (CBI 1984).
"The Scientific Conceptualization of Information: A Survey," *Annals of the History of Computing* (April 1985).

Research Notes

Academic colloquia provide scholars with the useful function of reporting on their research after they have made substantial progress, but before their results have appeared in printed form. The disadvantage of colloquia is that they spread word of this research only to a local community. We are instituting a new column in our newsletter with this issue, on work in progress in the history of information processing. The purpose of this column is to give early announcement of substantial research on historical research and writing projects, museum exhibits, film productions, and the like. This issue contains the following report of research by Arthur Norberg, based upon his final reports to NEH and NSF on historical research grants he has held. Although this report comes from a member of the CBI staff, it is our intention to announce the work of many scholars on the history of information processing. **We encourage our readers to send us material for inclusion in this column**.

Arthur L. Norberg recently completed an investigation on the origins of the digital computer industry in the United States through an indepth analysis of the work of several companies—Engineering Research Associates, Inc. (ERA); Remington Rand, and Sperry Rand—and an examination of the role of government and these companies in technical progress.

The project had three phases: historical research, oral history, and archives development. Tape-recorded interviews with over two dozen surviving ranking members of the management or research activity in ERA were conducted. These were transcribed and edited and are available for research through the Charles Babbage Institute. (See W.F. Aspray and B.H. Bruemmer, eds., *Guide to the Oral History Collection of The Charles Babbage Institute.* CBI 1986.)

The search for records involved work inside Sperry Corporation, approaches to over 100 individuals, resulting in a number of donations to CBI, and visits to use archives in other universities and companies. (See B.H. Bruemmer, ed., *Resourcs for the History of Computing. A Guide to U.S. and Canadian Records.* CBI, 1987.)

The project broadened beyond a study of ERA/Remington Rand and includes an analysis of their place in the United States industry. A book manuscript is in preparation focusing on the transition from the tabulator to the computer industry, the place of ERA and Eckert-Mauchly (EMCC) in this transition, the role of government in their work, and some contrasts between Remington Rand (the purchaser of ERA and EMCC) and IBM.

This research project was supported by NEH (ref: RO-21098-85) and NSF (ref: SES- 8420481) □

Symposium on the Legacy of John von Neumann

The American Mathematical Society, Hofstra University, and the Society for Industrial and Applied Mathematics have jointly organized a Symposium on the Legacy of John von Neumann. The symposium will take place Sunday through Saturday, 29 May —4 June, 1988, at Hofstra University in Hempstead, New York. Lectures will cover his contributions to mathematics, physics, and computer science, and place these contributions in the framework of today's research disciplines. A tentative list of invited speakers includes: Enrico Clementi, Alain Connes, John Conway, Jack Cowan, Harry Furstenberg, James Glimm, Herman Goldstine, Paul Halmos, Israel Halperin, Uffe Haagerup, Edwin Hewitt, W. Daniel Hillis, Arthur M. Jaffe, Richard B. Kadison, Shizuo Kakutani, George W. Mackey, Francis J. Murray, Michael J. Neumann, Donald Ornstein, Steven A. Orszag, Nicholas Pippenger, Irving E. Segal, Marshall H. Stone, Edward Teller, Nicholas A. Vonneuman, Marina von Neumann Whitman, and Edward Witten.

Registration and accommodation information can be found in the February 1988 issue of *Notices of the American Mathematical Society*, pp.291-297. □

Recent Publications

- Cipher A. Deavours et al., *Cryptologia: Yesterday, Today, and Tomorrow*. Norwood, MA: Artech House, 1987.

  A compendium of articles from *Cryptologia*, including a number of interest to historians of computing.

- Kenneth Flamm, *Creating the Computer*. Washington, DC: Brookings Institution, 1988.

  A well-written survey history of the U.S. computer industry, the technology driving it, the role of the federal government, and the competition from Europe and Japan.

- Margaret King, *Machine Translation*. Edinburgh: Edinburgh Information Tech. Series, 1987.

  Technical articles on machine translation with a long historical section.

- W. W. Simmons, *Inside IBM: The Watson Years, A Personal Memoir*. Bryn Mawr, PA: Dorrance, 1988.

  Through an account of his personal history in IBM sales and product planning, Simmons depicts IBM as a company driven by marketing rather than engineering, and as a company heavily influenced by its punched card business as it entered the modern computing age. □

CHARLES BABBAGE INSTITUTE
NEWSLETTER

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Endangered Species: The Records of Acquisitions

Any plan to improve sources for the history of the computer industry must include the records of acquired businesses. The list of computer companies or divisions that were purchased by other companies includes some of the most important players in the computer industry. Among general-purpose computer manufacturers this list includes Philco, Bendix, Daystrom, RCA, Raytheon, Computer Research Corporation, Electrodata, General Electric, and others. While some of these operations were not the successes of the computer industry, there is no question that their records are significant sources of information about themselves, their competitors, and computer technology.

However valuable, the prospect of these records being made available to historians is not good; the records of acquisitions are among the most endangered historical sources. The main impetus for their preservation largely relates to continuing legal obligations. Once these have expired, the records are likely to be lost and eventually destroyed. Even if there is an archival program, their preservation simply may not be a priority for a corporate archives with limited resources. One archivist at a large international conglomerate once commented that he had trouble locating the number and names of acquisitions, much less their records.

For a public archives interested in such records, the first and most difficult task is finding them. Even moderately-sized companies can have a number of facilities throughout the nation, any of which can hold historically-valuable records. If a division of a company is purchased, the records may stay with the original company, or possibly the collection will be split. The existence of a records management program on either side does not necessarily aid in locating material. Records of acquisitions can become subsumed in the records of other divisions, making them impossible to retrieve even with an automated records management system. There is no guarantee that the company itself is aware that it possesses such records.

The Computer Department of the General Electric Company provides a good example of the fate of the records of acquisitions. GE's computer operations were located in the Phoenix area beginning in 1954. Among GE's most

Computer assembly room at the General Electric Computer Department plant in Phoenix, Arizona. This photograph, taken around 1959, shows power supplies being assembled for the NCR-304, which was manufactured by GE. CBI recently learned that most of the records from the Computer Department were destroyed sometime around 1985. This and other photographs of the assembly area were donated by former GE employee, Bill Petterson.

successful efforts were the ERMA banking automation system, the 600 series computer (which picked up a good share of IBM 7090/7094 customers when IBM introduced the 360), and time-sharing systems. Even so, progress in the marketplace was hampered by a number of factors, and GE felt that it could not afford to invest enough to make the company a contender in the computer industry. In 1970 it pulled out of the general-purpose computer market and sold its operations to Honeywell. Honeywell has since then spun off its operations under Honeywell Bull.

During the past year CBI has been engaged in locating records of the Computer Department. A few calls to General Electric suggested that the records remained in Phoenix when ownership of the facilities was passed on to Honeywell. In May, 1987, CBI's archivist attended a reunion of Computer Department personnel in Scottsdale, but none of the former employees knew what had happened to the department's records. Contact with Honeywell Bull's public relations turned up a newspaper clippings scrapbook and a film on computer manufacturing from the GE days (copies of which were donated to CBI), but nothing else. The trail ended with a call to a records manager with the company, who said that Honeywell had

been pressed for space at one of its facilities containing a large collection of records. The result was that almost all records related to GE were disposed at a landfill sometime in 1984 or 1985. There is certainly a good chance that high-level records have been retained at the headquarters of General Electric or even Honeywell, but there is little doubt that the core collection was in Phoenix and no longer exists.

If there is any consistency in how the records of acquisitions are handled, there seems to be two common sense rules. First, the more central an acquisition is to the computer operations of the purchasing business, the greater the likelihood that the records will be saved. Honeywell's acquisition of the entire Datamatic Corporation was central to its entrance into the computer industry, so there may be a good chance that most of the records have survived. Similarly, Cedar Engineering's records remain intact because the acquisition formed the basis of Control Data's Peripheral Products Division. Second, records are much more likely to survive if they don't need to be moved. Had Honeywell closed the building that housed the General Electric records, they would have been destroyed much earlier. Engineering Research Associates records from the

New Exhibit Opens at Deutsches Museum

(This article was prepared by Joachim Fischer, Curator for Computer Science and Automation—Microelectronics at the Deutsches Museum.)

A new exhibition in the Deutsches Museum in Munich, West Germany, devoted to computer science, automation, and microelectronics is under way. Its main part, the Computer Science and Automation Hall, opened on 7 May, 1988, the microelectronics exhibit will follow in 1989.

The Computer Science and Automation Hall is the first of several high-technology halls for which space has been created on the third floor of the museum. New halls on telecommunication, surveying, and astronomy and astrophysics, to be located in its immediate vicinity, will open within the next four or five years. Even though the computer exhibit area will be large, about 10,000 square feet with an additional 4,000 square feet on the microelectronics gallery overhead, it is not large enough to accommodate all the objects in the museum's collections worthy of display. The creation of the new space and the construction of the exhibition was made possible through a combination of public funding and industrial support.

The basic layout of the hall is chronological. It starts out with early geometrical instruments and computing devices, both analog and digital, including mathematical tables, as well as significant collections of sectors and planimeters. A highlight is the museum's collection of mechanical calculating machines from the 18th through the early 20th century. The display on automation starts out with some rare automata from the Renaissance and continues up to the robot technology of today. The important contributions to program control made by Charles Babbage are unfortunately not represented by historical objects, but the first successful applications for general loop-structure program control are represented in Konrad Zuse's Z3 of 1941 (authorized reproduction) and Z4 of 1944 (original), both using electro-mechanical relays.

The Univac I (1951) by Remington Rand and the PERM built in 1952-1956 by Piloty and Sauer represent universal computers which surpass the loop-structure devices, following the ideas of Eckert, Mauchly and von Neumann. In addition, there is a series of commercial computers from the 1950s. Peripheral equipment completes the picture of this development. A small but interesting section deals with cryptological devices, another one with logical machines. There is also a display of analog computing devices and of process control computers. Above the main floor of the computer hall there is a gallery display on microelectronics. An introductory section shows the development of the physical phenomena. There follows a display on the production of pure silicon and other base material for the manufacture of chips, as well as a display on the manufacture of integrated circuits.

Examples for the programmed applications of microprocessors and microcomputers are also demonstrated. A demonstration area is included, where small calculators can be operated by the visitor. This area also treats the most important aspects of software and programming techniques.

The didactic element forms an important part; demonstration models are scattered throughout the exhibition.

F. L. Bauer is responsible for the conception of the exhibition, as well as chairing the technical advisory committee. H. Zebhauser is responsible for the design, and J. Fischer for the display objects and project supervision. Besides the above, the project team also includes H. Zemanek, R. Baumann, A. Krösa, K. Weinhart, and U. Schmidt. Many other museum employees as well as a number of active members of the technical advisory committee, have contributed to the project. The project also benefitted from industrial and commercial support. □
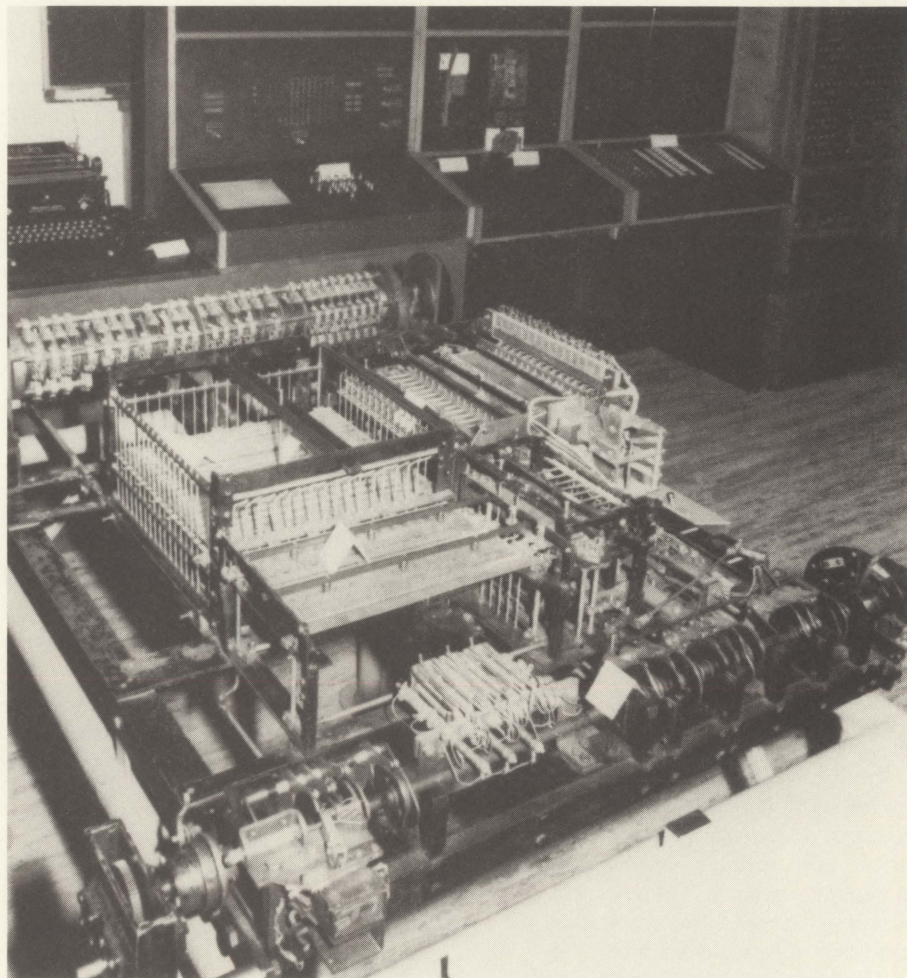
This historical model of the Zuse Z4 computer is one of the artefacts on exhibit in the new Computer Science and Automation Hall at the Deutsches Museum in Munich. The photograph was donated to CBI by Dr. Konrad Zuse.

1950s were found in the same building that served as the headquarters of the corporation, even though the facility has lived through a number of mergers.

Further insight to the records of acquisitions is being provided by an industrial records project conducted by CBI with support from the National Historical Publications and Records Commission and the Control Data Corporation. Among the tasks of the project is an investigation of the records of C-E-I-R, an early computer service bureau and software firm which was acquired by Control Data in 1967. While C-E-I-R remained a separate entity for a few years after the purchase, its operations where quickly folded into existing Control Data operations. Its records seem to defy the two rules set above. At some point all of C-E-I-R's records at its Washington, D.C. office were shipped to Control Data in Minneapolis. It was obvious that there was no pre-selection of records; one box contained toll booth receipts from one of C-E-I-R's salesmen. Evidently the company simply had to send all of the existing records somewhere. Unfortunately most of the records document C- E-I-R's activities close to the time of the merger, especially those representing legal obligations assumed by Control Data. Virtually nothing from the 1950s had survived. In this respect, the treatment of C-E-I-R's records is typical of other acquisitions.

It is widely held among historians and archivists that businesses must become more responsible for the preservation and maintenance of their own historically-valuable records. While a few computer companies have developed archival programs, their resources understandably must be focused on the primary, on-going operations of the company. Public archives have an important role in selectively preserving the records of acquired companies, and businesses should consider donating such records before heading to the landfill. □

"Should 'Fifth Generation Computers' Be Banned?" *Journal of Computers in Mathematics and Science Teaching* (Spring 1985).

Historical Introduction, Harvard Computation Laboratory, *Proceedings of a Symposium on Large-Scale Digital Calculating Machines* (CBI Reprint Series, MIT Press/Tomash 1985).

"Marketing the Monster: Advertising Computer Technology," *Annals of the History of Computing* (April 1986).

editor (with Arthur Burks), *John von Neumann's Papers on Computers and Computer Theory* (CBI Reprint Series, MIT Press/Tomash 1986).

"International Diffusion of Computer Technology, 1945-1955," *Annals of the History of Computing* (October 1986).

"The Mathematical Reception of the Computer," in E.R. Phillips, ed., *Studies in the History of Mathematics* (Mathematics Association of America 1987).

"Bibliography of Secondary Sources on the History of Software," *Annals of the History of Computing* (October 1987).

editor, *Computing Before Computers* (Iowa State University Press, forthcoming 1988).

co-author (with Michael Gunderloy) "National Bureau of Standards Contributions to Early Computing and Numerical Analysis," in R. Kargon and S. Leslie, eds., *Science and Technology in the Public Interest: The National Bureau of Standards in the Post-War Era, 1945-85* (Johns Hopkins University Press, forthcoming 1989).

Related professional activities: associate editor, MIT Press Series in the History of Computing, 1982-present; associate editor-in-chief, CBI Reprint Series; reviews editor, *Annals of the History of Computing*, 1986-present.

Paul E. Ceruzzi, 1979-80 and 1980-81 fellowship recipient. P. Ceruzzi received his Ph.D. in American Studies from the University of Kansas, Lawrence, in 1981. His dissertation title was, "The Prehistory of the Digital Computer, 1935-1945: A Cross-Cultural Study."

Positions held: 1980-81 Texas Tech University, history department, visiting professor; 1981-84 Clemson University, history department, assistant professor; 1984- present National Air and Space

Museum, Smithsonian Institution, associate curator of aerospace computing and electronics.

Selected publications in the history of computing:

"The Pioneering Computers of Konrad Zuse," *Annals of the History of Computing* (July 1981).

"An Unforeseen Revolution: Computers and Expectations," in J. Corn, ed., *Imagining Tomorrow* (Cambridge, Mass. 1986).

Introduction, Harvard Computation Laboratory, *A Manual of Operation for the Automatic Sequence Controlled Calculator* (CBI Reprint Series, MIT Press/Tomash 1985).

"The First Generation of Computers and the Aerospace Industry," *Research Report 1985* (National Air and Space Museum).

Reckoners: The Prehistory of the Digital Computer, 1935-1945 (Greenwood Press 1983).

William K. McHenry, 1981-82 and 1982-83 fellowship recipient. W. McHenry received his Ph.D. from the University of Arizona in 1985. The title of his dissertation was, "The Absorption of Computerized Management Information Systems in Soviet Enterprises."

Positions held: 1985-present, Georgetown University, school of business administration, assistant professor.

Research interests: Soviet and Eastern European computing: hardware, software, absorption of computing into the general economy, networks, software engineering, computer-integrated manufacturing.

Selected publications in the history of computing:

"The Integration of Management Information Systems in Soviet Enterprises," in J. Hardt, ed., *Gorbachev's Economic Plans, vol. 2*, Congress of the United States Joint Economic Committee, 1987, pp. 185-199.

"Computer Networks in the Soviet Scientific Community," in C. Sinclair, ed., *The Status of Soviet Civil Science: Proceedings of the Symposium on Soviet Scientific Research*, NATO Headquarters, Brussels, Belgium,

September 24-26, 1986, (Martinus Nijhoff Publishers 1987), pp. 151-175.
"The Application of Computer Aided Design at Soviet Enterprises: An Overview," in J. Baranson, ed., *Soviet Automation: Perspectives and Prospects*, (Lomand Press 1987), pp. 57-76.
co-author (with S.E. Goodman) "Computing in the USSR: Recent Progress and Policies," *Soviet Economy 2*, 4 (Sept.-Dec. 1986), pp. 327-354.
co-author (with S.E. Goodman) "MIS in USSR Industrial Enterprises: The Limits of Reform from Above," *Communications of the ACM 29*, 11 (November 1986), pp. 1034-1043.

Stuart Shapiro, 1985-86 and 1986-87 fellowship recipient. S. Shapiro expects to receive his Ph.D. from Carnegie Mellon University in 1988. The topic of his dissertation is computer software as technology: an examination of technological development.

Positions held: 1985 Carnegie Mellon University, department of engineering and public policy, technical consultant; 1987-88 Carnegie Mellon University, department of history, teaching fellow.

Research interests: software engineering, professionalization, programming languages.

Clifford I. Nass, 1986 fellowship recipient. C. Nass received his Ph.D. in Sociology from Princeton University in 1986. His dissertation title was, "Society as Computer: The Structure and Skill Level of Information Work in the United States, 1900-1980."

Positions held: 1986-present Stanford University, communication department, assistant professor.

Research interests: Information processing in organizations, emergence of information economy.

Selected publications in the history of computing:
"Information, Work and Information Work: A Retrospective and Prospective Framework," in I.H. Simpson and R.L. Simpson, eds., *Research in the Sociology of Work*, vol. 4, *High Tech Work* (JAI, in press).
"Following the Money Trail: Twenty-Five Years of Research into the Information Economy," *Communication Research* (December 1987).

Frederik Nebeker, 1987-88 fellowship recipient. F. Nebeker expects to receive his Ph.D. from Princeton University in 1988. The topic of his dissertation is the history of computation in meteorology.

Positions held: 1983-88, Princeton University, research and teaching assistant.

Research interests: Scientific application of computers, scientific application of punched-card machines.

Shane Greenstein, 1988-89 fellowship recipient. S. Greenstein expects to receive his Ph.D. in economics from Stanford University. His dissertation topic is computers, compatibility, and economic choice.
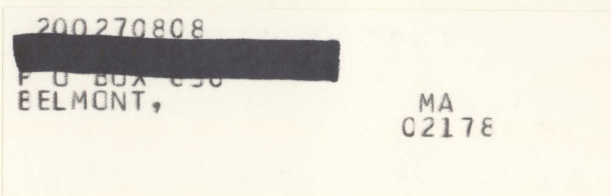
Positions held: 1985-present, Stanford University, economics department and the Center for Economic Policy Research, research assistant.

Research interests: Federal government agency computer system choice, the relationship between economic processes and interface standardization, technical innovation and economic processes. □