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CBI Newsletter Editor: Jeffrey R. Yost

**Charles Babbage Institute
211 Andersen Library
University of Minnesota
222 21st Avenue South
Minneapolis, Minnesota 55455**

**Email: cbi@tc.umn.edu
Ph. (612) 624-5050
Fax: (612) 625-8054**

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CBF at CBI (2-3 June 2006)

Friends and family gathered at the Charles Babbage Institute over the weekend of 2-3 June 2006 to mark an important moment in the history of computing. Arthur Norberg was CBI's first permanent director and he served in this capacity from 1981 to 2006, apart from a brief interlude in the mid-1990s. For a quarter century, Arthur provided extraordinary leadership to CBI and to the wider community of scholars and practitioners concerned with all aspects of the history of computing. This extended community—the friends of CBI, members of the Charles Babbage Foundation, Arthur's friends, university and professional colleagues—came together for a celebration to mark Arthur's retirement as CBI director and to reflect on the past quarter century of the field.

Events began on Friday, June 2, with a special welcome for the CBF Board and Trustees, who generously provided co-sponsorship for the weekend. CBI opened up its offices in the University of Minnesota's Andersen Library for tours, a viewing of unique treasures such as Edmund Berkeley's fascinating "Giant Brain" board game (an offshoot from his hugely influential 1949 book of the same name) and a guided trip through the underground archives. In preparation CBI staff members prepared and installed two new exhibits in our display cases. Our external display case greeted visitors with the entire array of CBI activities, stretching back to the founding moment in 1978 when Erwin Tomash outlined his vision at Rockefeller University for an organization to "foster, encourage and support activities related to the history of the information sciences." (See the special issue of *Annals of the History of Computing* 23:4 [2001].) Much has happened since then. There is literally a shelf of Ph.D. dissertations supported by the Adelle and Erwin Tomash Fellowship, 26 in all and counting. Another shelf was filled with the dozen volumes of the CBI-Tomash reprint series. Several landmark books have been published by CBI staff, including Norberg's own *Transforming Computer Technology* (Johns Hopkins University Press 1996) and *Computers and Commerce* (MIT Press 2005). And selected artifacts, photos, and documents from the CBI archival collections rounded out the display. It was an impressive representation indeed of CBI's academic and professional achievements.

Inside the CBI office suite, however, there lurked a well-hidden surprise. After months of secret planning, and literally at the last possible moment, CBI staff installed a more personal exhibit on Arthur Norberg's achievements and accomplishments over the years. When Arthur arrived Friday morning, it was a done deal. There, in our internal display case, was proof positive of his place in this amazing history—Arthur's books, articles, reports, and a selection of his numerous oral histories. Photos of Arthur, over the years, beamed out at the onlookers. On display also was Arthur's own Ph.D. dissertation, the dissertations of his students, and a selection of his teaching materials. A special four-course "tasting menu" at the University's Campus Club rounded out the festivities for the day.

On Saturday, we convened a day-long workshop with the goal of appraising the past quarter-century of computing history. Inescapably, Arthur's role in helping shape that history was front and center. We were fortunate indeed that five of the community's most prominent scholars were able to attend the event and share their perspectives on the field. Bill Aspray (Indiana University) spoke movingly of his own experiences as CBI's associate director working with Arthur and others in the pioneering phase in the 1980s. Bill also discussed Arthur's role in setting the guiding philosophy and policies for CBI, and the several challenges and opportunities that CBI responded to. Michael Mahoney (Princeton) asked us to rethink the main "lines" of development in computing, with a focus on such machines as the ENIAC and EDSAC. He suggested a new set of historical problems in doing a close, almost archeological, examination of software as a non-material cultural artifact.

After a break for lunch, Jim Cortada (IBM) gave an overview of his *Digital Hand* trilogy, where he has investigated the use of computers by American industry. He among others stressed that the current generation of scholarship rests on the pioneering work done by Arthur and collaborators in not only collecting historical materials but also writing foundational narratives. Martin Campbell-Kelly gave the last formal paper, assessing recent trends and approaches in writing the history of software. Comments from the audience on each paper helped broaden the day's perspectives. Reflecting on the craft of history, Steve Usselman (Georgia Tech) observed that Arthur had always evinced "great care" in his scholarly work and in his stewardship of CBI. His synthetic comments served as a bridge to comments by CBI and CBF founder Erwin Tomash and then final reflections by Arthur himself. The group continued its lively discussions during a reception in the Andersen Library atrium, and then a select group of friends and family adjourned to a festive celebratory dinner and toasting in the W.A. Frost restaurant's Dacotah Room in downtown St. Paul.

Revised versions of these papers are forthcoming in *Annals of the History of Computing* (tentatively Fall 2007), inspired in part by the special issue of *Annals* honoring the Tomashes and their legacy in history of computing (volume 23:4 October-December 2001).

Thomas Misa

“The Commercialization of the Internet and Its Impact on Business” Deutsches Museum, Munich

In July CBI director Tom Misa and associate director Jeff Yost participated in a three-day workshop hosted by the Deutsches Museum in Munich. The workshop offered an important opportunity for the book’s contributors, many of them from the U.S. and U.K., to interact with the active community of German scholars working on computing history. Participants also had guided tours of the Museum’s computer and telecommunications exhibits by curators Hartmut Petzold and Oskar Blumtritt. It was truly a singular experience to see 20 computer historians descend on the famous ENIGMA device, the program-controlled relay-driven ZUSE Z4 from 1945, an opened-up Remington-Rand UNIVAC 1 from 1956 (large enough to walk into), and the classic wrap-around “sofa-seat” CRAY-1 from 1983. During breaks in the program the group sought some relief from the heat on cool banks of the Isar river.

There was serious scholarly work, too. Two dozen scholars convened in the Museum’s Kerschensteiner Kolleg, which offers conference space and accommodations right in the Museum complex. William Aspray, former CBI associate director, explained the genesis of this hugely ambitious project. He initially aimed to write a book on the commercial internet himself, but quickly realized that the scope and complexity of the project would be too daunting for any single individual to take on. He outlined a number of key topics, and then contacted scholars in the field to create the first true historical examination of the commercial Internet.

While numerous works by journalist and popular science writers begin to tell the story, this project mobilizes the full historians’ toolbox by drawing on economics, media studies, history of technology and science, as well as library studies and critical studies. In discussing the ten workshop papers, as well as exchanges during meals, there was a productive tension between the U.S. scholars who were attempting to wade their way through largely uncharted historical materials (the most recent citation was to a paper scarcely one month old!) and the German scholars who emphasized that the Internet was from the start an international phenomenon.

It is notable that no less than six contributors to the book, forthcoming from MIT Press, are past CBI-Tomash fellows. Editors William Aspray and Paul Ceruzzi were the very first two Tomash fellows, and both are well known as prolific authors and intellectual leaders in the history of computing community. In addition to their work in shaping the project, Aspray has authored a ground-breaking chapter on the history of music file sharing, from the technical and legal foundations in the 1970s through to today’s post-Napster landscape, while Ceruzzi writes a critical framing chapter on the internet prior to commercialization (based in part on Tomash fellow Janet Abbate’s research).

Former Tomash fellow Shane Greenstein, presently the Elinor and Wendell Hobbs Professor at Northwestern's Kellogg School of Management, contributes an important chapter based on his research on internet service providers (ISPs). ISPs grew from small beginnings in 1993 into a \$24 billion industry a decade later. Thomas Haigh, assistant professor in the School of Information Studies at the University of Wisconsin-Milwaukee, writes on the software infrastructure of the commercial internet, including email, web browsers, and search engines. Nathan Ensmenger, assistant professor in History and Sociology of Science at the University of Pennsylvania, writes on "reluctant users" of the internet. Ensmenger finds that college professors are enthusiastic users of email, but they have not embraced web-based instructional methods. Similarly while physicians (and patients) use the web extensively for research, email has made little inroad on patient-doctor communications. And in a chapter that helps understand today's news about social networks, Atsushi Akera examines the use of the internet to build communities and companies such as Monster.com and MySpace.

The paper by CBI's Jeff Yost also breaks new ground. He rightly observes that we need to better understand how the Internet and Web "changed the playing field" for businesses, creating both opportunities and challenges. Yost takes up four non-media industries where the challenges have been especially acute. Travel agents have seen their world turned inside out—online travel bookings were a \$68 billion business in 2005—and successful ones have needed to specialize in niche markets exploiting special knowledge about destinations. And contrary to the idea of dis-intermediation, where consumers deal direct with providers, the travel business today is populated by a legion of new cyber-intermediaries, such as Priceline, Expedia, Travelocity, and Orbitz as well as MyTravel in the U.K. Realtors and mortgage brokers form another industrial sector where traditional barriers to information have largely vanished. Through Realtor.com anyone now has access to the once-closed MLS listings. Yet, perhaps because of the housing boom, overall revenues to agents and brokers remain strong. Yost also deals with challenges in the PC industry. As is well known, Dell Computer effectively exploited IT to create and deliver high-quality, customized products beginning in the 1980s. In its wake such firms as IBM, Compaq, and Gateway struggled with various "intermediary" strategies to sell their PCs. Yost even picks up the debate on outsourcing and off-shoring, drawing in part on his recent visitation to India's IT centers. Curiously Dell has a huge outsourcing presence in India, with three call centers as well as software development and product testing in Bangalore, but only 4 percent of the Indian market—less than a quarter that of rival HP. Understanding the complex dynamics of globalization, already a challenge for the computer field, will certainly also be a challenge for computer historians in the years to come.

Thomas Misa

SHOT Annual Meeting 2006

The Society for the History of Technology (SHOT) held its annual meeting at the Imperial Palace in Las Vegas from Thursday, October 12th through Sunday, October 15th. On Thursday evening SHOT President and director of MIT's Program in Science, Technology and Society Rosalind Williams gave the Presidential Address. Williams drew on historical scholarship, literature, film, and other sources to explore themes of technological determinism, attitudes toward opening the "black box" of technology, and the place of the history of technology in the larger field of history. She stressed the appropriateness of the setting of the meeting—on Las Vegas's Strip, the ultimate human-built environment—an environment in continual flux as real estate values soar, and where demolition, rebuilding, and reinvention are ever present phenomena.

On Friday, SHOT's Special Interest Group for Computers, Information, and Society (SIGCIS) held its annual lunch meeting. SIGCIS chair Thomas Haigh of the University of Wisconsin-Milwaukee spoke briefly about the group's activities, sponsorship of SHOT sessions, the website directory of members' scholarly interests and projects, and other matters. Charles Babbage Institute (CBI) director Thomas Misa announced CBI's plans for two major research projects, one on the social, technical, and business history of Moore's Law and a second on the history of the National Science Foundation's Web-based Fastlane system for grant submissions and management. He also announced CBI's plans for a conference on the history of computing and gender tentatively scheduled for May 2008; further details about this event will be forthcoming.

The SHOT meeting was filled with numerous sessions and papers on a wide range of topics and themes of the history of computing. In a session on public subsidy and technological change in U.S. transportation and information systems Thomas Misa presented a paper titled, "Revisiting the Rate and Direction of Technological Change: Scenarios and Counterfactuals in the Information Technology Revolution." In this insightful talk Misa challenged the linear, monocausal explanation of the relationship between military spending and technological change expressed widely in the existing literature, including in the recent book by distinguished economist Vernon Ruttan, *Is War Necessary for Economic Growth?: Military Procurement and Technological Development* (Oxford University Press, 2006). Misa described how this perspective discounts the important role played by the private sector. He cited the cases of IBM's entrance and early growth in the digital computing field and AT&T's work in transistors as examples where the literature ignores the strategic plans of these firms to tap non-military, private sector markets for these technologies. More broadly, he argued that disproportionate attention has been placed on the *rate* of technological change rather than the qualitative factors that help shape the *direction* of technological change. Misa also served as chair and commentator for a session entitled "Technopolitics of Space."

Indiana University Rudy Professor of Informatics William Aspray chaired and commented on a session sponsored by SIGCIS that analyzed different aspects of the Internet and American business in the 1990s. Versions of the papers in this session will

appear as chapters in a forthcoming book on the Internet and American business being edited by Aspray and Paul Ceruzzi (Smithsonian) [See article on Munich workshop]. Past Tomash fellows Thomas Haigh and Atsushi Akeru (of RPI), respectively, gave papers on the software infrastructure of the commercializing Internet and social networking and community informatics. As part of the session, CBI associate director Jeffrey Yost presented a paper entitled, "The Internet and the Transformation of American Industries: A Case Study of Travel Reservations." Yost also served as chair and commentator for a session on computer games and standards development. The papers in this session were: past Tomash fellow Nathan Ensmenger (Pennsylvania), "Is Chess the Drosophila of AI? Computer Games as Experimental Technologies in Artificial Intelligence"; Casey O'Donnell (RPI), "Nintendo Entertainment System and the 10NES Chip: Carving the Video Game Industry in Silicon"; and Jan Jornmark and Mirko Ernkvist (Gothenburg), "Arcade [sic] Do What Other Entertainment Don't: Differentiation and Growth in the U.S. and Japanese Arcade Industry, 1971-2005."

Other papers on the history of computing presented at the conference are listed below.

Janet Abbate (past Tomash fellow), "'Close to the Machine': The Construction of Computers and Programming Skill." David Brock and Christophe Lécuyer (past Tomash fellow), "Silicon Gate: The Making of a High Tech Manufacturing Process." Greg Downey, "Space, Time and the 'Automated Library.'" Philip Frana (past CBI software history project manager), "Nudging History Online: From the Mechanics of Immersion to the World of Warcraft." Sharon Ghamari-Tabrizi, "The Shift in Design Styles in Pentagon War Games During the Cold War." Douglas Jones, "Technologists as Political Reformers: Lessons from the Early History of Voting Machines." Ron Kline, "Constructing Cybernetic Mechanism and Bionic Humans: Cold War Tensions in Cybernetics in the United States, 1948-1970." Dov Lungu, "The Origins of Roles of the Early Macintosh User Groups: 1984-1987." Mathew Payne, "Leveling-Up: The Department of Defense as a Video Game Author." Bryan Pfaffenberger, "'In Counting There is Strength': Tammany Hall, Election Reform, and the Origins of New York's Remarkable Affection for the Mechanical-Lever Voting Machine." Hector Postigo, "Video Game Appropriation Through Modifications: Attitudes Concerning Intellectual Property Among Video Game Programming Hobbyists." Roy Saltman, "The Invention of Voting Machines: Addressing Election Integrity and Administrative Effectiveness." Fred Turner, "Romantic Automatism: Art and Automation in Cold War America."

Jeffrey Yost

News from the Archives

Collection News

Robert Pomeroy donated records of the Inter-American Development Bank's computer operations in analytical modeling. The materials include analytical computer model user guides, general user guides and personal papers.

Russell Cowles donated a CURTA mechanical calculator, along with instruction manuals and other literature on the CURTA.

Additions to the William Norris papers and Association for Women in Computing records were received.

Finding Aid Update

Over the past four months, 59 finding aids were encoded in Encoded Archival Description (EAD). All currently processed collections now have an EAD encoded finding aid.

For the past two years, the Archives and Special Collections at the University of Minnesota have been engaged in a collaborative project to encode finding aids into EAD and have them available via one collective web search portal. The Digital Library Development Lab is continuing work on the Web interface for the EAD finding aids. Once the EAD site is up and running, significant changes will be made to how CBI delivers its finding aids on the Web. Currently CBI creates HTML finding aids for use on the Web and offers a basic keyword search function. Both of these will cease to exist, and patrons will be linked to our finding aids on the EAD site. Search capabilities will be expanded from what is currently available; keyword searching will still be offered, along with searching by title/name and advanced Boolean searching (AND, OR, NOT). Patrons will be able to broaden searches to multiple Archives and Special Collections or focus them to search to just one. Having CBI finding aids in EAD will allow for greater access to the institute's collections, along with the opportunity to conduct deeper, more concentrated searches.

Processing

CBI has processed the most recent addition to the Carl Hammer Papers. Processing continues on the Soviet and Russian Computing Collection (CBI 148), the Curt Monash Papers (CBI 160), and the International Y2K Cooperation Center Records (CBI 153).

Karen Spilman

George Glaser (1931-2006)

The history of computing community lost a dear friend and a longtime leader with the passing of George Glaser, who died at his home in Los Altos, California, on March 17, 2006. George was widely known as a pioneering information technology consultant, energetic leader of the IT profession through his service to numerous organizations, and key supporter of the history computing through his leadership of the Charles Babbage Foundation.

George was born on September 26, 1931, in Wheeling, West Virginia, and he grew up in West Virginia and Ohio. He studied at Notre Dame, where he received a B.S. in electrical engineering magna cum laude. His early career involved work as an aviation electronics office for the U.S. Navy, engineering for the Sandia Corporation, and product planning and management for Ampex. He joined McKinsey and Company in San Francisco as a consultant in 1961 and became a principal in 1967, specializing in data processing management and economic modeling. He opened McKinsey's Silicon Valley office in Palo Alto in 1970.

In 1973 George established an independent firm for consulting on high-tech corporate projects, and also served as managing partner for Centigram Enterprises in Silicon Valley. In 1977 he became president and CEO of the successor Centigram Corporation, a voice recognition and technology company. In 1981 he incorporated his consulting practice as George Glaser, Inc., and continued this activity until his retirement in 2004.

CBI is fortunate to have Glaser's papers as well as complementary collections from several organizations in which he was active. These collections provide detailed documentation of George's leadership roles in the Association of Computing Machinery (ACM), the Data Processing Management Association (DPMA), the American Federation of Information Processing Societies (AFIPS) and the International Federation for Information Processing (IFIP). He served as general chairman of the 1966 Fall Joint Computer Conference (San Francisco), and president and chairman of the board of AFIPS. George was also treasurer of the ACM (1968-72) and a regent of the DPMA Education Foundation (1975-77).

George played an especially prominent role in restructuring AFIPS, which had assumed major sponsorship of the industry's semi-annual conferences beginning in 1962, by creating the National Computer Conference in 1973. George was at the center of things as chairman of the National Computer Conference board from 1973 to 1975. This board set the overall direction and policies of these conferences, which featured technical sessions and exhibits relating to the field of information processing. Also in these years AFIPS launched the *Annals of the History of Computing*, which continued under the sponsorship of the IEEE after 1990. In 1980 George was named as U.S. delegate to IFIP, in which he became a trustee and vice president from 1982 to 1988. In IFIP he provided key leadership in management activities, marketing, congresses, and ethics. He served as host for the World Computer Congress in San Francisco in 1989, and was

awarded the IFIP Silver Core Award. His papers at CBI include a treasure trove of correspondence, memoranda, minutes of meetings, reports, brochures, newspaper clippings, and news releases.

George played a prominent role in several other areas as well. Not least was a prominent leadership role in the Charles Babbage Foundation, where he was president of CBF (1998-2002) and a member of the Board of Directors. He also chaired CBF's Software History Taskforce and helped point the way for the serious historical study of software. In recognition of his key leadership activities and sustained service, CBF named him Trustee Emeritus. "The passing of George is a huge loss to the field of computer history and to CBF," remarked CBF board chair James Cortada. He was one of the earliest members of Silicon Valley's Churchill Club, and served four terms on the club's board beginning in 1995. From 1998 to 2005 he was Governor of the International Council for Computer Communication.

As an on-going memorial to George's leadership in the history of computing, a group chaired by Karen Duncan, his wife of 26 years, has created the George Glaser Memorial Fund (GGMF). Other members include CBF Trustees David Arscott, Donn Parker, and Michael Baum. The GGMF seeks to create an endowed fellowship that will support visiting researchers working at CBI. A formal announcement of the GGMF will be forthcoming.

Thomas Misa

Bernard A. Galler, 1928-2006

Longtime member of the Charles Babbage Foundation's Board of Directors and close friend and supporter of the Charles Babbage Institute Bernard (Bernie) A. Galler passed away on September 4, 2006 in Ann Arbor, Michigan. Bernie was a pioneer in the field of computer science and an important advocate and supporter of the history of computing.

Bernie completed bachelor's and doctoral degrees from University of Chicago, and a master's degree from UCLA, all in mathematics. He met his wife of 55 years, Enid Harris, when they were undergraduates at the University of Chicago.

After completing his doctorate in 1955 Bernie became a faculty member of the Mathematics Department of the University of Michigan. He was in 1966 a founding professor of the University of Michigan's Department of Computer and Communications Sciences (later the Computer Science Department). He also was instrumental to the formation of the Department of Electrical Engineering and Computer Science in 1984. In 1994 he retired from the Electrical Engineering and Computer Science Department following a highly distinguished career.

Bernie was recognized leader in the software field. He was a primary developer of Michigan Algorithm Decoder (MAD), an influential early compiler used by the University of Michigan and a number of other universities. He taught undergraduate and graduate students throughout his career, and was advisor to numerous doctoral students. In one class, he led his students in developing an online course registration system, Computer Registration Involving Student Participation (CRISP), which was used by the University of Michigan for more than 15 years and freed students from the long lines of registering in person.

Bernie was very active in and provided excellent leadership to a number of professional organizations. He was a longtime member of the Association for Computing Machinery (ACM), and served as the ACM President between 1968 and 1970. He was the founding editor of the scholarly journal *Annals of the History of Computing*. Through his leadership this journal grew in recognition and importance, and continues to be a major force in advancing knowledge and scholarship in the history of computing. Bernie also served as the President of the Software Patent Institute (SPI) and provided expert testimony in many fundamental cases in the U.S. concerning software.

Bernie is known to many through his professional accomplishments and honors. A substantial, though smaller, number of individuals had the pleasure and honor to know him personally. He was an exceedingly generous, supportive, and enthusiastic person always willing to give his time, and offer his advice and insights, to help others. The Charles Babbage Foundation and Charles Babbage Institute benefited greatly from this, and he will be deeply missed.

Bernie is survived by his wife Enid, and their four children and their spouses: Bruce (Grace) Galler of Boulder, Colorado, Elaine (James) Levine of Atlanta, Georgia, Glenn (Carol) Galler of San Jose, California, Marilyn (Alan) Koschik of Solon, Ohio, and nine grandchildren.

Jeffrey Yost

William C. Norris, 1911-2006

Control Data Corporation co-founder and longtime President William Norris passed away August 21, 2006 after a long battle with Parkinson's Disease. He was 95. Norris was a visionary who led Control Data's growth to become the leading supercomputing firm in the world in the 1960s and a diversified producer/provider of computer hardware and services during the following two decades. Both during and after his active management of CDC (he retired in 1986) he distinguished himself as a philanthropic leader.

Norris grew up on a farm in Nebraska and went on to study electrical engineering at the University of Nebraska. He served in various capacities with Naval Communications Intelligence during the Second World War. Following the War, he joined with other naval officers to co-found Engineering Research Associates (ERA) in St. Paul in 1946.

ERA, along with Electronic Control/Eckert-Mauchly, was the first manufacturer of digital computers in the U.S. ERA and Eckert-Mauchly were taken over by Remington Rand in the early 1950s (which became Sperry Rand after merger with Sperry Gyroscope in 1955), and Norris became the leader of Sperry Rand's Univac division. Dissatisfied with the parent firm and sensing great opportunities in the computing field, he broke away with a couple key Sperry Rand engineers/managers to found Control Data Corporation in 1957.

Control Data thrived under Norris leadership. The firm grew rapidly and became the world's leading manufacture of large-scale scientific and engineering computers and a major producer of magnetic data storage for OEMs. It also became an important player in the computer services field. He was a leading advocate for cooperative industry research and initiated Microelectronics and Computer Technology Corporation and helped found the Midwest Technology Development Institute to further these goals.

In 1986 President Ronald Reagan awarded Norris with the National Medal of Technology. This award was given in recognition of his major contributions to the development of digital computer technology, leading and founding a highly successful computer hardware and services firm, his innovative application of computers to address societal needs, and his cooperative efforts to maintain and boost U.S. competitiveness in computing. In 1988 he founded the William Norris Institute (now at St. Thomas University) in support of innovative education and assisting new firms that advance technology and help address social needs.

Overall, Norris' long commitment to and leadership in philanthropic efforts both inside and outside CDC have helped tackle problems of K-12 education, agriculture, healthcare, and economic development.

Several years ago Norris donated his personal papers to the Charles Babbage Institute (CBI). This collection complements the larger Control Data Corporation Records, which are also held at CBI. Both collections are fully processed and available for use by researchers. In late August CBI developed an online exhibit in tribute to Norris on the CBI website. It contains a number of photos, a digitized document from the Norris Papers where he reflects on his career as a corporate leader and philanthropist, an oral history transcript in CBI's collections, and references to books and obituaries on Norris. The exhibit is at <http://www.cbi.umn.edu/exhibits/norris/index.html>

Jeffrey Yost

Recent Publications

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Compiled by Jeffrey Yost

Featured Photos: William Norris and Social Responsibility

In 1967, Control Data Corporation CEO William C. Norris began to take a hard look at social responsibility within the corporate environment. He started with a bold move, establishing an inner city plant in North Minneapolis that would produce a vital component of CDC's computers. The Northside plant began operations in November 1967 in an existing facility while a new plant was constructed. The new plant opened in March 1969.

The workforce was hired from the neighborhood. Many of the employees of the plant were high school drop-outs, individuals with little or no work experience, people on parole, or single mothers. CDC changed many of its hiring and firing practices to ensure that the workers had a chance to succeed.

Norris did not believe that the plant was a charitable contribution; it was held to the same standards as all CDC plants. To ensure that Northside could not be easily dismissed, Norris designated that it would become the only production plant of peripheral controllers, a vital component to CDC's business. CDC's management adopted the perspective that if Northside failed, so would CDC.

As problems occurred, Norris and others in CDC developed solutions. Absenteeism, especially for single mothers, was problematic. Norris knew that a child care facility was necessary. CDC partnered with other businesses in the community and a not-for-profit corporation was formed, establishing the Northside Child Development Center. The corporation was run by members of the businesses community, as well as parents. Over time the center became owned completely by the community.

After three years, Northside was considered proficient. Based on this success, CDC established other inner city and poverty-area plants, as well as became involved in urban planning, education, employee assistance programs, and health care.

Additional information on William Norris and his views on corporate social responsibility can be found in:

Worthy, James C. *William C. Norris: Portrait of a Maverick*. Cambridge, MA: Ballinger Publishing Company, 1987.

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Karen Spilman