MEMORIAL RESOLUTION
GEORGE BERNARD DANTZIG
(1914–2005)

George Bernard Dantzig, the C. A. Criley Professor of Transportation Sciences and Professor of Operations Research and of Computer Science, Emeritus, died at his campus home on May 13, 2005 at age 90.

Born on November 8, 1914 in Portland, Oregon, George Dantzig was given the middle name "Bernard" as an expression of his parents' hope that he would become a writer. This was not to be, even though late in his life George was engaged in writing a novel. Instead, George became a mathematician. He graduated from the University of Maryland with an A.B. in mathematics and physics (1936) and took his M.A. in mathematics from the University of Michigan (1938). After a two-year period at the Bureau of Labor Statistics, he enrolled in the doctoral program in mathematics at the University of California, Berkeley, with the intention of writing his dissertation on mathematical statistics under the supervision of Jerzy Neyman. Arriving late to one of Neyman's lectures, George copied down two problem statements from the blackboard thinking they were a homework assignment. George found these problems challenging. After a while though, he was able to solve them both and turned them in to the professor. As it happened, the problems were not just exercises but open questions in the field. The solutions to these problems became the two independent parts of George's doctoral dissertation. With the outbreak of World War II, George took a leave of absence from the doctoral program at Berkeley to join the U.S. Air Force Office of Statistical Control. In 1946, he returned to Berkeley to complete the requirements of his program and received the degree that year. Although he was interested in an academic career, he declined a job offer from Berkeley in favor of the position of Mathematical Advisor at the U.S. Air Force Comptroller's Office. There he took on another challenge that led to greatness. Tasked with the mechanization of planning procedures to support the time-staged deployment training and supply activities, in 1947 George Dantzig formulated the linear programming problem as a mathematical model for the planning problem and devised the simplex method for its solution. These achievements led to his titles as the "father of linear programming" and the "inventor of the simplex method."

While at the Pentagon, George worked on linear programming in the broad sense: developing its theory and algorithmic aspects, extending its applications, and bringing the possibilities of this important new methodology to the attention of mathematicians and economists. In 1952 George joined the mathematics division of the RAND Corporation. There he further enhanced the computational strength of linear programming and found further extensions of its applicability. While at RAND, George wrote a long series of research memoranda entitled "Notes on Linear Programming", which ultimately became material for his classic text/reference *Linear Programming and Extensions*. By 1960, George Dantzig was looking for new disciples. He left the RAND Corporation for academia, specifically UC Berkeley.

At Berkeley, George became a professor in the Department of Industrial Engineering. He founded and directed the Operations Research Center, a place where he worked with a dozen or so doctoral students on various aspects of what had by then come to be called "mathematical programming." This embraced linear and nonlinear programming as well as other forms of optimization. The field of operations research had become an academic discipline; it was bolstered by several professional societies and growing opportunities for government sponsored research. In 1963, Dantzig's *Linear Programming and Extensions* was published by Princeton University Press. Rich in insight and coverage of significant topics, the book quickly became "the bible" of linear programming.

George joined the Stanford faculty in 1966 as Professor of Operations Research and of Computer Science. A year later, the Program in Operations Research became a full-fledged department. George's contributions to the new department's teaching and research programs accounted for much of its leading position in the field. Naturally, his presence at Stanford attracted outstanding students, new faculty, and a stream of interesting visitors. By his reckoning, George supervised 41 Stanford doctoral students over 30 years. Today, many of these graduates hold prominent positions in major academic and industrial organizations.

For George Dantzig, the decade of the 1970s was especially productive. He had long been dedicated to advancing mathematical programming on all fronts. He particularly cherished the process of modeling significant practical optimization problems and developing mathematical and computational methods that would ultimately lead to their implementation. This outlook is exemplified by the Systems Optimization Laboratory (SOL), which he founded in 1973. Its purpose was to develop computational methods and associated computer routines for numerical analysis and optimization of large-scale systems. Most of George's students and faculty associates were involved in the activities of the SOL. In 1973, while on sabbatical leave, George headed the Methodology Group at the International Institute for Applied Systems Analysis (IIASA) in Laxenburg, Austria. That year, his book *Compact City* (coauthored with Thomas L. Saaty) was published. In it the authors advance the idea of a multi-story, cylinder-shaped city that operates on a 24-hour basis. The same year of 1973 is also remembered as the year of a Mideast Oil Crisis. This inspired George to launch an energy/economic project named "Planning Investment Levels Over Time." Known mostly by the acronym PILOT, this project brought together a number of George's favorite themes: large-scale optimization, dynamics, economic modeling, and planning.

In the same decade, George Dantzig was honored many times over. He received the National Medal of Science from President Gerald Ford, and the John von Neumann Theory Prize from the professional societies ORSA and TIMS. He was elected to the National Academy of Sciences, the National Academy of Engineering, and the American Academy of Arts and Sciences. He received four of his eight honorary degrees, became the C. A. Criley Professor of Transportation Sciences, and was elected to Phi Beta Kappa at his alma mater, the University of Maryland.

George Dantzig's amazing career just kept going, well beyond his (mandatory) retirement in 1985. He was recalled to duty year after year, and in that capacity, continued his teaching, his research projects, his mentoring, and his supervision of doctoral students.

In the latter role, George was an exceptionally good listener, rarely failing to offer a fruitful suggestion or viewpoint that would advance a student's understanding and progress. In the late 1980s, with the collaboration of Gerd Infanger, George returned to linear programming under uncertainty, a research topic he had pioneered at RAND in the mid-fifties. Using new methodologies and computer power, they made significant progress in a branch of optimization that George believed is "where the *real* problems are." In 1996, George's teaching activity came to a close, but his labors continued. He and Mukund N. Thapa completed and published two volumes of a projected four-volume work on linear programming and extensions. George's passion for the field he sired never vanished.

A day-long conference honoring George was held on November 12, 2004, just a few days after his actual 90th birthday. The attendees all shared a closeness to him. In some cases, the associations with George were made more than half a century ago. Happily, George was in fine form that day, and he seemed to relish the proceedings from beginning to end, including the conference dinner with its lengthy parade of after-dinner tributes. A couple of months later, George's health declined sharply, and a few months after that he suffered diabetic complications and passed away. George is survived by his wife Anne, whom he married in 1936, two sons David and Paul, and daughter Jessica Klass.

The practical and scholarly impact of George Dantzig's scientific contributions is enormous. He was a man of exceptional dedication, intelligence, generosity, and warmth. The greatness of his spirit will live forever in the memory of his family, friends, and colleagues.

Committee:
Richard W. Cottle
B. Curtis Eaves
Michael A. Saunders