Prof. George B. Dantzig Was 90

Prof. George B. Dantzig, the inventor of the ground breaking Simplex Method for allocating resources, died in Palo Alto on May 13 at age of 90 following a brief illness.

George was the first to formulate the general linear programming problem and to investigate its mathematical properties. This led him to invent the Simplex Method and to develop algorithmic refinements that enabled its reduction to practice. These seminal contributions helped to create the field of mathematical optimization as one of the most important domains of operations research. His many other contributions to mathematical modelling and optimization helped to lay the groundwork for many to follow — both in applications and theory. He will be remembered with respect and admiration by all of us.

In recognition of his work, US President Gerald R. Ford in 1975 presented Dantzig the nation's highest science award, the National Medal of Science. He received numerous other awards, as well, including what is now the INFORMS John von Neumann Theory Prize.

Dantzig's vision of modelling economic systems became the most widely used technique of its kind for the efficient allocation of resources in industry and government. Before Dantzig's research, economists trying to "optimize" the way they assigned staff and other resources had only disappointing mathematical tools that fell short of successfully solving real-world problems.

His contribution was the development in 1947 of linear programming. His formulation of linear programs as mathematical models for efficient allocation of resources and his development of a unique algorithm – the Simplex Method – to solve them was a seminal event in the development of mathematical programming as a scientific method for optimally managing resources.

The invention of the computer coincided with his research and became a signification coincidence. When it awarded Dantzig an honorary doctorate in 1976, the University of Maryland issued a statement, writing "His development of linear programming in 1947, occurring almost simultaneously with the development of the first computers, led to an explosion of economic, environmental, and statistical applications. As an example, the iron and steel industry has used a Dantzig programming method to evaluate iron ores, explore the additional of coke ovens, and select products. The Federal Energy Administration is using his method to evaluate energy policy alternatives, and linear programming has also been used or suggested for use to control water and air pollution…"

His work led to the growth of operations research in the 1950s. Operations research, known as the "science of better," is the discipline of applying advanced analytical methods to help make better decisions.

Dantzig contributed to the development of many other areas of operations research, including all major areas of mathematical programming, quadratic programming, complementary pivot theory, convex programming, stochastic programming, and game theory. Like a fictional character in the film "Good Will Hunting," the young George Dantzig once solved a problem on a blackboard that had stumped veteran mathematicians.

As published in Washington Post on Thursday May 19, 2005 Dantzig's short biography is presented below.

George B. Dantzig, 90, a mathematician who devised a formula that revolutionized planning, scheduling, network design and other complex functions integral to modern-day business, industry and government, died May 13 at his home in Palo Alto, California. The cause of death, according to his daughter, was complications from diabetes and cardiovascular disease.

George Bernard Dantzig was born in Portland, Ore., in 1914. His father, Tobias Dantzig, was a Russian mathematician who had gone to Paris to study with Henri Poincare, the renowned French mathematician and philosopher of science. Tobias Dantzig married Anja Ourisson, a student at the Sorbonne who also was studying mathematics, and the couple immigrated to the United States.

In the early 1920s, the Dantzig family moved to Baltimore and then to Washington, where Anja Dantzig became a linguist at the Library of Congress and her husband taught mathematics at the University of Maryland. Their son attended Powell Junior High School and Central High School, where he was fascinated by geometry. His father nurtured his interest by challenging him with complex geometry problems -- thousands of them.

Dr. Dantzig received his bachelor's degree in mathematics and physics from the University of Maryland in 1936 and his master's degree in mathematics from the University of Michigan in 1937.

Although he enjoyed statistics, abstract mathematics bored him. Abandoning academia, he moved back to Washington in 1937 and took a job with the Bureau of Labor Statistics.

In 1939, he resumed his studies at the University of California at Berkeley, studying statistics under mathematician Jerzy Neyman. An incident during his first year at Berkeley became a math-world legend.

As Dr. Dantzig recalled years later, he arrived late for class one day and saw two problems on the blackboard that he assumed were homework assignments. He copied them down, took them home and solved them after a few days. "The problems seemed to be a little harder to do than usual," he said. On a Sunday morning six weeks later, an excited Neyman banged on his student's front door, eager to tell him that the homework problems he had solved were two of the most famous unsolved problems in statistics. "That was the first inkling I had that there was anything special about them," Dr. Dantzig recalled.

From 1941 to 1946, he was the civilian head of the combat analysis branch of the Air Force's Headquarters Statistical Control. His task was to find a way of managing "hundreds of thousands of different kinds of material goods and perhaps fifty thousand specialties of people," seemingly intractable problems that spurred his search for a mathematical model for what would become linear programming.

He received his doctorate from Berkeley in 1946 and returned to Washington, where he became a mathematical adviser at the Defense Department, charged with mechanizing the planning process. Based partly on his earlier work with aircraft supply flow, he worked out the simplex algorithm.

In 1952, he became a research mathematician with the Rand Corp. and began implementing linear programming on computers. In 1960, he became a professor at Berkeley and chairman of the Operations Research Center, and in 1966, professor of operations research and computer science at Stanford University. He remained at Stanford until his retirement in the mid-1990s.

Survivors include his wife of 68 years, Anne Dantzig of Palo Alto; three children, David Dantzig of Cleveland, Paul Dantzig of New York and Jessica Klass of Berkeley; three grandchildren; and two great-grandchildren.

His daughter noted that as an influential teacher for many years, her father had two families -- his own and the hundreds of students who studied and worked with him throughout his long career.

He won numerous awards for his groundbreaking work, including the National Medal of Science in 1975. He was the author of the pioneering book "**Linear Programming and Extensions**" (1963), updated in 1997 and 2003, and he co-authored "**Compact City**" (1973). He had been working on a science fiction novel in recent years, "**In His Own Image**," about a plague that wipes out mankind.

Sources:
http://www.informs.org/Press/dantzigobit.htm
http://www.washingtonpost.com/wp-dyn/content/article/2005/05/18/AR2005051802171.html