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George B. Dantzig Dies at 90; Devised Math Solution to Broad Problems

By JEREMY PEARCE

Dr. George B. Dantzig, a mathematician who devised an algorithm that helped create linear programming, now a vital tool in computing, industry and other fields, died on May 13 at his home in Stanford, Calif. He was 90.

The cause was complications from diabetes and heart disease, his family said.

Dr. Dantzig, who was an emeritus professor of operations research and computer science at Stanford University, began his career working for the federal government, analyzing labor and military statistics.

While making calculations for the Air Force in 1947, Dr. Dantzig developed the simplex algorithm, which enabled mathematicians, economists and others to consider large numbers of variables in broad–reaching decisions about the production and allocation of airplanes, their parts and raw materials.

He performed his research with primitive calculators, but the completion of the simplex algorithm coincided with the development of the computer, soon allowing more complicated problems to be solved in markedly less time. The field that resulted, called linear programming, has been applied subsequently to utilities, oil refineries, investments and the steel industry to aid in planning and efficiency under uncertain conditions. It has also been used to prepare cost–effectiv nutritional diets and coordinate the routes of commercial aircraft.

Dr. Dantzig explained his methods in a landmark book published in 1963, "Linear Programming and Extensions."

Dr. Saul I. Gass, an emeritus professor of operations research at the University of Maryland, recalled that Dr. Dantzig "looked at a class of problems, recognized the structure behind it and then set up a mathematical basis that would maximize efficiency and minimize the costs."

Dr. Gass added: "The proof was really in the practice. George's algorithms succeeded in solving large problems in a few steps."

In the 1950's and 60's, Dr. Dantzig broadened his simplex method to economic models, to reduce paper waste in the printing industry and to other problems of applied mathematics. With another researcher, Philip Wolfe, he developed the Dantzig–Wolfe decomposition principle, which is intended to simplify oversized problems in planning and logistics involving vast amounts of data.

Like the simplex method, the principle is expressed in mathematical terms "as an elegant algorithm and theory that has since been modified and extended to many other domains," said Dr. Robert Freund, a professor of operations research at the Massachusetts Institute of Technology and a former student of Dr. Dantzig's.

Dr. Dantzig's other interests included game theory, quadratic programming and a means of studying problems that involve significant uncertainty, known as stochastic programming. Dr. Freund said Dr. Dantzig's pioneering research in linear programming had yielded "bold new mathematical tools" for the field of operations research, which applies analytic methods to various forms of decision making.

The son of a mathematician, George Bernard Dantzig was born in Portland, Ore. He received degrees from Maryland an the University of Michigan before earning his doctorate from the University of California, Berkeley, in 1946.

After working for the Air Force, Dr. Dantzig joined the RAND Corporation in 1952 as a research mathematician. In 1960, he became a professor of operations research at Berkeley. He moved to Stanford in 1966 and continued to teach and publish into the 1990's.

In 1975, President Gerald Ford awarded him the National Medal of Science. Dr. Dantzig was a member of the National Academy of Sciences and the American Academy of Arts and Sciences.

He is survived by his wife of 68 years, Anne; two sons, David, of Cleveland, and Paul, of Scarsdale, N.Y.; a daughter, Jessica Klass of El Cerrito, Calif.; three grandchildren; and two great–grandchildren.

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