Jack A. Morton

Jack Andrew Morton

1913-1971

By Morgan Sparks

Jack A. Morton died on December 11, 1971, at the age of fifty-eight. He had spent his entire professional career at Bell Laboratories, where, at the time of his death, he was Vice-President of Electronic Technology.

During his thirty-five-year Bell Labs career, which began in 1936, Mr. Morton made major contributions in the fields of electrical circuit engineering, vacuum tube development, and transistor and solid-state device development.

Jack Morton was born on September 4, 1913, in St. Louis, Missouri. He graduated from Wayne University in 1935 with a Bachelor of Science degree in electrical engineering, and, upon receiving a Master of Science degree in electrical engineering from the University of Michigan one year later, he joined Bell Labs.

His early years were devoted to research and development in microwave technology. He conceived and developed high-frequency transmission measuring methods that exceeded the ranges of previously existing means by a factor of ten. Later he aided the development of the grid-return amplifier at microwave frequencies, an achievement that, by extending the range of early radars, had an important effect on the course of World War II in the Pacific.

After shifting to tube development, Mr. Morton designed a close-spaced microwave tube that, thirty years later, is still the heart of the transcontinental radio relay system for voice and TV trans

mission. The new features he pioneered in this tube were interelectrode spacings one-quarter of that used in any previous tube and a specially developed long-life cathode coating with one-third the thickness of then-current practice.

Shortly after the invention of the transistor at Bell Labs in 1948, Mr. Morton became the leader of a team responsible for the development and introduction to manufacture of the first economically and technically feasible transistor. He suggested the first widely used equivalent circuit for the transistor, as well as methods for finding other equivalent circuits. He also pointed out important stability conditions and devised a method widely used for measuring minority carrier lifetime in semiconductors. He recognized very early the importance of single-crystal material in the performance of semiconductor devices and supported enthusiastically the development of that field. He contributed numerous suggestions in the fields of semiconductor surface conduction phenomena, device design, and metallurgical techniques.

In 1952 Mr. Morton became Assistant Director of Electronic Component Development, and in 1953 he was named Director of Transistor Development. Two years later he advanced to Executive Director with broadened responsibilities in component development, and in 1958 he became Vice-President of Electronic Technology.

Mr. Morton served as Chairman of Bell Labs' Education Committee from 1965 to 1968, and during these years he laid the groundwork of a comprehensive in-hours continuing education program for the professional staff. At the time of his death, he was Chairman of the Bell Labs' Committee on Technical Management.

Jack Morton was awarded many honors: honorable mention, Outstanding Young Electrical Engineer, Eta Kappa Nu (1948); Wayne University Alumni Award (1951); University of Michigan Centennial-citation for contributions to science (1953); Honorary Doctor of Science, Ohio State University (1954); Honorary Doctor of Science, Wayne University (1956); David Sarnoff Medal by IEEE for "outstanding leadership and contributions to the development and understanding of solid state electron devices" (1965); election to the National Academy of Engineering (1967); IEEE Reliability

Group Award (1969). Posthumously, the IEEE Jack A. Morton Medal was established to be awarded annually for "outstanding contributions in the field of solid-state devices."

Jack Morton was the author of numerous articles. His book, *Organizing for Innovation,* was published simultaneously in the United States and Japan in 1971. As inventor and coinventor, he held twenty-four patents.

He was a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), a Member of the Advisory Council of the School of Engineering at Stanford University, a Member of the Visiting Educational Committee at the University of Michigan, and Chairman of the Board of Trustees of the Rutgers Preparatory School. He was also a Member of the honor societies Eta Kappa Nu, Tau Beta Pi, Sigma Xi, and Phi Kappa Phi. He served on various committees of the IEEE, the National Academy of Engineering, the National Academy of Sciences, and the U.S. Government.

Jack Morton was a born innovator and a natural leader. Many and diverse were his talents and interests. He approached problem solving with a characteristic and unique mix of originality, vitality, and uncanny insights. This led him to widely acclaimed contributions in the fields of electronics, education, management, and corporate organization. In the words of James B. Fisk, President of Bell Laboratories at the time of Morton's death, "Jack Morton was one of those rare breeds of men who not only generate a vast number of technological innovations themselves, but also develop and inspire others to produce major innovations in concepts, systems, and technology. He was a man who devoted his life to propagating technical ideas and developing technical people, and was able to blend management theory and management practice." He was an incessant reader, an articulate writer, and an inspiring speaker. His counsel was sought by many and was given freely. Tragically, he died at the peak of his productive life. His accomplishments survive him and will continue to benefit technology and society.