



*Robert A Henle*

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1924-1989

By Erich Bloch

Robert A. Henle, a pioneer in semiconductor technology and the director of the Advanced Silicon Technology Laboratory in the IBM Thomas J. Watson Research Center, died January 27, 1989. Mr. Henle was an IBM fellow, an Institute of Electrical and Electronics Engineers (IEEE) fellow, a member of the National Academy of Engineering, and a recipient of the IEEE Edison Medal in 1987 for his "sustained efforts in, and individual contributions to, the science and technology of semiconductor circuits in computing systems."

Born in Virginia, Minnesota, in 1924, Mr. Henle served as a Navy pilot from 1944 to 1946 and then returned to the University of Minnesota, from which he received his B.S. and M.S. in electrical engineering in 1949 and 1951, respectively. He joined IBM soon after his graduation, and remained there throughout a career that spanned more than thirty-five years of remarkable productivity.

Bob Henle began working on transistor circuits while still a graduate student; his M.S. thesis investigated the operation of a point contact transistor in a bistable circuit. At IBM he joined a group studying the application of semiconductor devices to computers. This early work in solid state circuits was applied first in various accounting machines and then on a large scale in the IBM 608, which was IBM's

first all-transistor computer. He then worked to develop high-speed circuits for the Stretch Computer System and the IBM 7090 series computers, which were at the leading edge of computer designs in the late 1950s, and for the Model 91 in 1962. This work was extraordinarily important to IBM and the future direction of the entire computer industry, for Bob Henle's work and personal determination were the key factors in IBM's decision in the 1960s to convert to solid state electronics for all computer systems. In recognition of these contributions, he was appointed an IBM fellow in 1964.

As an IBM fellow, Henle concentrated on developing monolithic memory technology, the first application of which was in storage protect memory in the System 360/Models 91 and 95. The basic techniques he invented became the foundation of all IBM semiconductor main memories and influenced the entire semiconductor industry. He developed the 128-bit chip that was used in 1970 in the main memory of the System 360/Model 145, and his memory technology was the basis of the IBM System 370 family of machines.

Henle became manager of Advanced Technology for IBM's Components Laboratory in 1975, and was appointed director of the Advanced Silicon Technology Laboratory in 1980. In that position he directed an interdivisional laboratory that has been responsible for many of the most important of IBM's current technologies. In addition Henle served two terms on IBM's Corporate Technology Committee, a body that oversees technology development for the entire corporation.

Throughout his career Bob Henle had a remarkable ability to combine scientific and engineering insights to create new concepts and new products. He was one of the first to see the limits of ferrite cores—the dominant memory technology of the 1950s and 1960s—and to understand the potential of monolithic memory technology to increase the capacity and speed of computer memories, thus making possible entire new generations of computers.

He never stopped searching and learning, or trying new ideas on old and unanswered problems, and this made him a respected teacher as well as a distinguished researcher. He remained a productive inventor to the end of his career, with forty-eight patents and more than twenty-five papers to his credit. His advice was sought after by the technical community inside and outside of IBM, and he continued to set an example for younger engineers.

Mr. Henle was honored for his accomplishments in many ways. He received the Department of Defense Citation for "Exceptionally Meritorious Civilian Service" in 1974. He was elected a fellow of the IEEE in 1966 and to the National Academy of Engineering in 1982. In April of 1988 a symposium in his honor was held at the IBM Thomas J. Watson Research Center. At various times in his career he chaired a number of committees of the IEEE, and he also served as an officer in the Computer Society.

Robert Henle devoted his life to creating some of the most important technologies of the modern world. His accomplishments have affected all of us indirectly, while those of us who were privileged to know him and to work with him were affected in a direct and inspiring way. He lived his life fully and productively, and in that he was an inspiration to us all.