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1916-1995

By David Packard

Bernard M. Oliver, Silicon Valley pioneer and director of research and development at Hewlett-Packard for four decades, died on November 23, 1995. He was seventy-nine years old.

Dr. Oliver, known to his friends and family as "Barney," a man of enormous intellect, curiosity, and vision. He leaves behind a legacy of extraordinary contributions in the field of electronics, radio engineering, physics, astronomy, computer science, and biology.

Born in Soquel, California, Barney studied electrical engineering at Stanford University, graduating with a B.A. degree in 1935 at the age of nineteen. Two of his fellow students were William Hewlett and David Packard, both of whom were impressed by their precocious classmate. The following year Barney earned an M.S. degree from the California Institute of Technology. He then spent a year studying in Germany on an exchange scholarship, returning to Caltech to complete his Ph.D., magna cum laude, in 1940. He was twenty-four years old.

Barney then joined the renowned Bell Telephone Laboratories in New Jersey, where he quickly established a reputation for brilliant, creative insights and clever inventions. He made major contributions to the development of the new and all-important "radar," and was a key contributor to the earliest television systems. His paper on pulse code modulation,

"Philosophy of PCM," remains a seminal work to this day. While at Bell Labs, he met and married a young actress named Priscilla Newton, who was to share his life until she died in 1994. They had three children: Karen, Gretchen, and William Eric.

While Barney was making his mark at Bell Labs, William Hewlett and David Packard were starting a new electronics instrumentation firm in Palo Alto, California. They decided that Barney was the person they needed to lead their research efforts. After many discussions and increasingly attractive offers, they persuaded Barney to join their fledgling operation. In 1952 Barney returned to his beloved California to become director of research for the Hewlett-Packard Company.

A hands-on director, Barney immediately set the standards for excellence that have become Hewlett-Packard's hallmark. In 1957 he became vice-president of research and development, and in 1966 he established Hewlett-Packard Laboratories (HP), the company's central research and development organization, which he directed until his retirement in 1981. Under Barney's leadership HP Labs quickly became one of the world's foremost research and development organizations as well as the birthplace of many of HP's successful products, including the HP2116, HP's first computer; the HP9100 desktop scientific calculator; and the HP35, the first scientific hand-held calculator. Barney also served on the Hewlett-Packard board of directors from 1973 until 1981.

While at HP, Barney continued to pursue a lifelong interest in radio astronomy. His background in radio engineering prompted an interest in radio astronomy and the possibility that radio telescopes might be a means to detect extraterrestrial intelligent life. He was fascinated when, in 1960, attempts were made to detect radio waves from other civilizations. He had already calculated that such a search, with existing telescopes, made sense. He visited this first search at the National Radio Astronomy Observatory in Green Bank, West Virginia, but it was not until 1971 that he was able to immerse himself fully in this endeavor. Taking time off from HP, Barney guided a major feasibility study of possible radio telescope systems for the search for extraterrestrial intelligence (SETI), sponsored by Stanford University and the National Aeronautics and Space Administration (NASA) Ames Research Center.

This effort spawned "Project Cyclops," a seminal and grandiose plan for a radio telescope system capable of detecting quite ordinary extraterrestrial radio signals from great distances in our galaxy. Although the design was very sound and the report a monument to fine scientific and technical writing, the projected ultimate cost of the project, some tens of billions of dollars, far exceeded what was politically acceptable. The report stands to this day as a sound description of an ingenious and noble albeit unfulfilled enterprise.

Barney retained a close relationship to SETI throughout the rest of his life. He made numerous contributions to the scientific and technical design of SETI searches and systems. Following his retirement from HP, Barney devoted his energies full-time to SETI, serving as director of the NASA Ames SETI office from 1983 to 1993. During this period SETI became a major project within NASA with an overall budget of more than \$100 million. This project reached a milestone in the fall of 1992 when its extremely sophisticated radio receiving equipment started searching the extraterrestrial radio signals at both the Goldstone tracking station of NASA and the Arecibo Observatory in Puerto Rico. Unfortunately, the U.S. Congress cut off funding for this project just one year after the searching began.

Some ten years earlier, Barney had been a prime mover in the formulation of the SETI Institute, a not-for-profit scientific institute that was formed to conduct research related to life in the universe with maximum efficiency and at the lowest possible cost. Disdaining bureaucracy and waste, Barney saw the SETI Institute as an experiment that would demonstrate that the highest research could be done with minimal management and overhead cost. Upon his retirement from NASA in January 1994, he joined the board of directors of the institute. Over the decade since its inception, the institute has become an extremely successful research center, just as Barney imagined and planned it would. His last act for the institute was to provide it with a major bequest to ensure its continued activity and success for a very long time.

Barney received a host of awards during his life, foremost of which was the National Medal of Science, which he received at the White House in 1986. He served as vice-president (1962) and president (1965) of the Institute of Electrical and Electronics Engineers (IEEE), after being made a fellow of its predecessor organization, the Institute of Radio Engineers, in 1954 and director-at-large in 1958. In 1966 he was appointed to the President's Commission on the Patent System. In 1990 he received both NASA's Medal for Exceptional Engineering Achievement and the Pioneer Award of the International Foundation for Telemetry in recognition of a lifetime of service to the telecommunications profession.

Other significant honors include the Caltech Distinguished Alumnus Award for 1972; IEEE's Lamme Medal for meritorious achievement in the development of electronic instrumentation and measuring devices, 1977; the Halley Lectureship on Astronomy and Terrestrial Magnetism of Oxford University, 1984; and the Harvey Mudd College Wright Prize for Multidisciplinary Scientific or Engineering Accomplishments, 1984. He was an adjunct professor of astronomy at the University of California, Berkeley, and served on the boards of directors of the Exploratorium in San Francisco, Geostar Corporation, and Associated Universities, Inc. He was a founder of the Biosys Corporation, which seeks environmentally sound means to eliminate agricultural pests.

Barney was awarded some fifty patents, with some pending, and he authored some seventy-one publications in more than seven scientific and technical fields. In 1991 Hewlett-Packard Laboratories established the Bernard M. Oliver Symposium on the Future, an annual distinguished lecture series in his honor. He received the NASA Group Achievement Award for the NASA SETI project in 1993.

Barney also generously donated his time in the service of education and the community. He served on the Palo Alto Unified School District Board from 1961 to 1971 and was a member of the engineering advisory councils at both Stanford and the University of California, Berkeley. He was appointed for ten years as a consultant on the engineering and safety of

the new San Francisco/Oakland Bay Area Rapid Transit (BART) System. He served as a consultant to the Army Scientific Advisory Panel and a member of the Congressional Review Committee for the National Bureau of Standards. Just before his death, Barney was an active member of the Dean's Advisory Council for Natural Sciences at the University of California, Santa Cruz.

He was a generous donor to causes he felt were important, although he never sought public recognition for his philanthropy. He made major contributions to the universities he had attended, as well as to the Universities of California at Berkeley and Santa Cruz. At Santa Cruz he endowed a scholarship fund in theater arts in honor of his wife, Priscilla Newton. He contributed to many educational enterprises, including contributions of computers and associated equipment to middle schools.

Barney especially liked to support scientific enterprises he deemed worthy but, in some cases, neglected, especially if they might contribute to understanding and discovery of life in the universe. He made major contributions to the Exploratorium, the Monterey Bay Aquarium, and the San Francisco State University/Marine World Dolphin Communications Project. Among his largest gifts was one to the Allegheny Observatory at the University of Pittsburgh to allow the upgrading of the lens of its largest telescope, which was being used to search for extrasolar planetary systems. Another was a \$200,000 challenge grant to the Monterey Institute for Research in Astronomy (MIRA), which used the funds to build a high-quality observatory at Chew's Ridge, near Carmel, which was named the "Oliver Station" in honor of Barney.

Barney was widely known and admired for his strong communications skills, a trait Barney attributed to his mother, a teacher who instilled in him at an early age a reverence for proper grammar. As a result, his scientific papers were models of clarity, his conversations terse and to the point. In short, he believed that clear, concise communication was important to success, whether the communication be with humans, dolphins, or people of other stars. As one final request to

humanity, just before he died Barney finished the manuscript of a book detailing the fine points of English grammar and why they in fact ensure clarity in communication.

Barney Oliver's cornucopia of intellectual and practical gifts to the world, as well as his personal example, will continue to enrich us far into the future.

