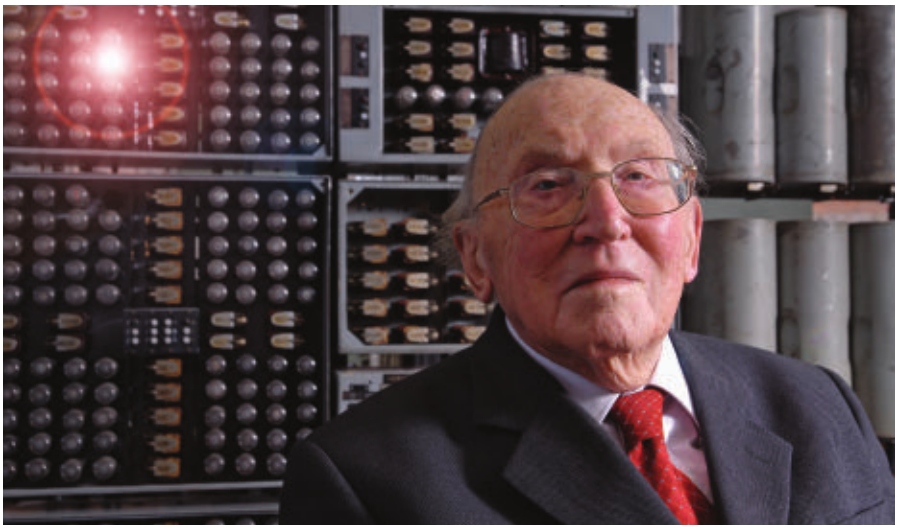
Obituary | DOI:10.1145/1897816.1897827 Leah Hoffmann

Maurice Wilkes: The Last Pioneer

Computer science has lost not only a great scientist, but an important link to the electronic computing revolution that took place in the 1940s.

Sir Maurice Wilkes didn't like to bicker about who was first when it came to groundbreaking technical achievements. Nonetheless, history credits him with a number of important innovations, including the creation of the world's first practical stored-program computer—the earliest machine capable of running realistic programs and producing useful results—as well as the invention of microprogramming. With his death on November 29, 2010, at the age of 97, computer science lost not only a great scientist, but an important link to the electronic computing revolution that took place in the 1940s.



Maurice Wilkes in front of the Harwell computer, now being restored at the National Museum of Computing, Bletchley Park.

Wilkes was born on June 26, 1913 in Dudley, Worcestershire, England. He initially struggled in school due to recurring bouts of asthma. By his teens, however, he found his stride in the study of science and mathematics, supplementing his education with a subscription to *Wireless World* and a keen interest in amateur radio transmission. In 1931, he entered St. John's College, Cambridge to study mathematics. Subsequent graduate studies on the propagation of radio waves provided his first experiences with computing, as he seized an opportunity to work with the university's differential analyzer, a device that used wheel-and-disc mechanisms to solve differential equations.

World War II interrupted his budding career, and Wilkes left for war service in 1939, working on radar and operational research. Although Alan Turing had been a classmate at Cambridge, Wilkes was unaware of the computing developments under way at Bletchley Park during the war. After World War II, he returned to Cambridge as the head of the mathematics laboratory (later named the computer laboratory), where he was tasked with investigating new possibilities in calculating machinery. A chance encounter with John von Neumann's 1946 draft report on the EDVAC—the yet-to-be-built successor to the electronic computer designed by Americans John Mauchly and J. Presper Eckert during the war—convinced him which direction to take.

The EDSAC, or Electronic Delay Storage Automatic Calculator, took two-and-a-half years to build. Thirty-two tanks of mercury provided memory by delaying pulses that were sent from an electrically charged quartz crystal. Programs were entered with punched tape. On May 6, 1949, EDSAC successfully computed a table of squares, and the machine remained operational until 1958.

Wilkes was intimately involved with computers for the rest of his career. In 1951, with David Wheeler and Stanley Gill, both research students at the time, he published the first textbook on programming methods. (Recalling those early efforts in his memoir, Wilkes remarked that he quickly realized the remainder of his life would be spent finding errors in his programs.) Later that year, while laying plans for the EDSAC 2, he hit upon the idea of using a stored program to represent the sequences of control signals within the computer. He called the technique "microprogramming."

Wilkes received numerous honors during his lifetime, including being the second recipient of the ACM A.M. Turing Award, in 1967.

Wilkes is remembered by colleagues as a thorough and meticulous researcher. "He was relentlessly professionally driven," says Andrew Hopper, a Cambridge computer science professor who collaborated with Wilkes, Roger Needham, and others in the 1970s on an experimental local area network known as the Cambridge Ring. Post-retirement, Wilkes continued his research through a series of consultancies, working steadily in areas like network systems and multimedia conferencing. "He was completely active every day," says Hopper. C

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