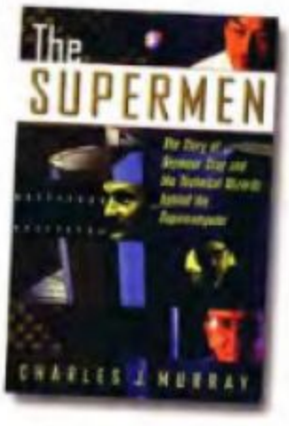
How the future was

Seymour Cray and his supercomputers comprise the secret history of the century. By Mark Williams

The Supermen: The Story of Seymour Cray and the Technical Wizards Behind the Supercomputer
By Charles J. Murray
John Wiley & Sons
232 pages, $24.95

1951 Univac-1: built from 5,000 vacuum tubes, with tape drives threaded together by fishing line on pulleys. This was the year Marciano beat Louis and Truman deposed MacArthur in Korea. Engineers in a converted glider factory in St. Paul were paying attention to a new coworker: Seymour Cray, as nondescriptly crew cut as any other young World War II veteran....

Charles J. Murray's *The Supermen* travels back to the world that preceded our own, placing Cray's genius within "a postwar culture where engineers were valued," where a generation bootstrapped computers into reality using only slide rules, vacuum tubes, and their imaginations. That glider factory, where Cray began after graduation, belonged to Engineering Research Associates (ERA), which the U.S. Navy had nudged into existence so that former navy men could continue developing the electronic technology of the Bombes (the decrypting machines on which the founding father of computing, Alan Turing, worked in wartime Britain). Mr. Murray tells how Cray stood out immediately for knowledge, engineering instincts, and something more unaccountable—an ability to conceive and hold whole in his mind the working circuitry of the new computing machines.



This is our century's real history. In 1954, after Remington Rand assimilated ERA, Cray was the 29-year-old supervising engineer on the ERA division's search for a technology to supersede vacuum tubes in the guidance systems of the Air Force's intercontinental ballistic missiles. The corporation's Univac division was also searching for a new technology for the ICBMs; it chose magnetic switches. But Cray preferred a little-known candidate invented in 1947: joining other frustrated ERA engineers in a new company in 1957, after a merger created the conglomerate Sperry-Rand, he used transistors in his designs.

1960 The CDC 1604: the world's fastest computer, with a clock speed of 5 microseconds—and only as big as several filing cabinets. The computer business talked about Seymour Cray, who'd built the 1604 from cheap loads of substandard transistors, moving his fledgling Control Data Corporation ahead of giants International Business Machines and Sperry-Rand....

If anything, Mr. Murray makes clear that the man was more interesting than the legends. When the rest of CDC's management wanted to move further into business-oriented computing, Cray intended only to build faster machines for his scientific customers. Resigning as engineering director, he moved his lab to his Wisconsin hometown, Chippewa Falls.

1963 The CDC 6600: silicon transistors, refrigerant Freon tubes, 50 times faster than the 1604. This was the year of Kennedy's assassination and King's "dream" speech. The 6600's power so advanced computerized nuclear simulations that the United States negotiated a test-ban treaty with the USSR....

Through the late '60s, Cray kept pushing, developing the 7600 with a speed of 25 nanoseconds and planning the 8600 to cycle at 8 nanoseconds (a 1995 PC with a Pentium microprocessor, *Supermen* points out, cycles at 10). When CDC cut his funding, Cray left to start Cray Research.

1976 The Cray-1: integrated circuits that mowed through 80,000 operations per second in vector mode. By 1983, 50 of the Western hemisphere's 70 supercomputers were Crays; the rest were CDC machines descended from his designs....

1985 The Cray-2: 6 to 12 times faster, with windows into a metal tank where 64 processors sat in fluorocarbon coolant—which, as this scalar supercomputer calculated, *boiled*. Meanwhile, Gorbachev became general secretary and Windows appeared. Workstations could now do much of the work of supercomputers....

1993 The Cray-3: radically substituting gallium arsenide for silicon, with a 2-nanosecond cycle. But the Berlin Wall was down, government budgets were slashed. Struggling, Cray Research had spun Cray off into a separate company. Cray ended up *giving away* the single Cray-3....

Although Cray-4 prototypes attained 1-nanosecond cycles, Cray's company closed in 1995. Like the moon landing, supercomputing seemed an unsustainably expensive Cold War achievement. Thus, even if *Supermen* weren't also a wonderful read, Mr. Murray must be commended for interviewing so many historic players: Cray shortly before his death, colleagues, even his father. Because these people are starting to go—we need to get their stories before it's too late.

Recently, there's been some movement again. The government is spending and the new thing is "scalable architecture," an offspring of "massively parallel" processing that bunches masses of PC microprocessors. Just before he died in October of 1996, Mr. Murray says, Cray had decided microprocessors were ready for supercomputing: he was planning "a typical Seymour Cray computer with Intel inside."

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