



Calculating through Time - BB (Boring)

A History of Computing Technology by Michael Williams

Reviewed by Nick Sands

The story of computers, from fingers to IBM mainframes, is the story of technology. It is an interesting story, scrupulously researched and well narrated by the eminently qualified head curator of the Computer History Museum, Michael Williams. Williams has a PhD in Computer Science from the University of Glasgow and has been a member of the IEEE History Committee. He taught Computer Science at the University of Calgary, has written 8 books, published over 70 articles, and has received many awards for both his teaching and his writing.

Williams starts at the beginning, numbers and counting. This quickly progresses to basic tools like knotted cords, tally sticks, the abacus, and the amazingly powerful quadrant, sextant and compass. The early tools led to John Napier's calculating sticks or "bones", and finally to the slide rule. Mechanical calculating machines were developed as early as ancient Greece, but the technology was lost for hundreds of years. Blaise Pascal and Gottfried Leibniz made great progress, but Charles Babbage stands out as one of the great geniuses of mechanical calculating machines with his difference engine and analytical engine.

Analog calculating machines, built to solve or simulate specific equations such as the tides, were developed in the 1800's. The most sophisticated was the differential analyzer built at MIT by Vannevar Bush in 1931. These machines were critical in advancing control theory in World War II. Electromechanical computers were also developed at the same time, starting with the machines of Konrad Zuse. His Z4 machine used 32,000 relays. There were other computers built at Bell labs and Harvard. The electronic computers, including the ENIAC and Colossus were developed during World War II. While ENIAC was not the first, it was still one of the most significant. Built at the University of Pennsylvania for Aberdeen Proving Ground, the ENIAC (Electronic Numerical Integrator and Computer) used high speed vacuum tubes as well as relays and weighed 30 tons.

By adding memory, computers could store programs instead of reading punched tape or cards. The common memory for many computers was a mercury delay line, a liquid filled tube that held acoustic pulses which were read and resent through the tube. It is amazing to read of the machines constructed with dual 'processors' such as the EDVAC, BINAC, and finally the UNIVAC which had a 2.25 Mhz clock. Eventually computers became a commercial product with IBM as one of the leading manufacturers. And here the story ends.

Not every engineer enjoys history, but for those who do this is an excellent book. Williams makes it interesting: including fact's like Babbage's feud with street musicians. In terms of general appeal this book would have to be classified as Boring BB, but I found it fascinating. The second edition, published in 1995, is available through Amazon.com for about \$54, new.