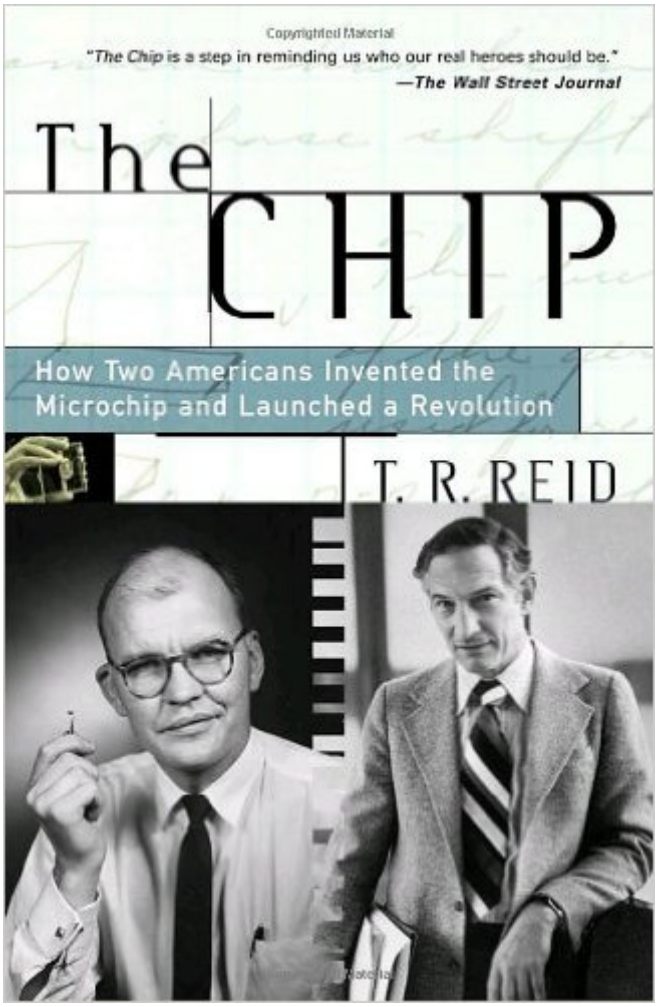
The Chip : How Two Americans Invented The Microchip And Launched A Revolution



Synopsis

Barely fifty years ago a computer was a gargantuan, vastly expensive thing that only a handful of scientists had ever seen. The worldâ ™s brightest engineers were stymied in their quest to make these machines small and affordable until the solution finally came from two ingenious young Americans. Jack Kilby and Robert Noyce hit upon the stunning discovery that would make possible the silicon microchip, a work that would ultimately earn Kilby the Nobel Prize for physics in 2000. In this completely revised and updated edition of The Chip, T.R. Reid tells the gripping adventure story of their invention and of its growth into a global information industry. This is the story of how the digital age began.

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Customer Reviews

The writing is reasonably engaging and does its best to attract general interest to a technical subject. However the tactics with which it does so are more National Enquirer than New York Times. The author decides to choose sides in the debate over who invented the microchip, and delivers pages of invective to support his position. The industry, in contrast, recognized both Kilby and Noyce as inventors and paid royalties to both companies they worked for. In short, the author tries to retroactively arrange a boxing match between the inventors, while the co-inventors in reality cordially shook hands and agreed to split the profits. The intensely partisan presentation of the story in this book is a gross offense to the characters of the inventors.In addition, the text is littered with errors. "A diode is a dam that blocks current under some conditions and opens it to let electricity

flow when the conditions change" is a mighty vague way to say that diodes let current flow one direction and not the reverse. "Materials that have proven the best insulators are indeed those with eight outer electrons" flat out does not parse. Does the material have eight electrons? Is he trying to say that noble gases are the best insulators? "Elements with three or fewer outer electrons are conductors, and those with five or more are insulators" would come as a surprise to metals such as arsenic, antimony or selenium. "Shockley had a reputation for getting the most out of the people who worked for him". I won't even touch that one. "The process that eventually proved best - the process still used today in semiconductor manufacture - was a Bell Labs discovery called diffusion" has so many inaccuracies in one sentence it's hard to know where to start.

Technophobes might as well move on to the next review. I loved this book. It explained in clear, precise language how innumerable barriers were overcome by innovative and insightfully brilliant individuals to create a device that revolutionized our lives. I've always been fascinated by electronics, built my own radios and earned an amateur radio license in 7th grade, just because the subject and theory of how electrons move around to perform useful functions is intriguing. Reid has captured much of that fascination and translated it into a great story. Before integrated circuits could be produced, the transistor had to be invented. Before that time, switching mechanism, required a vacuum tube to control, amplify and switch the flow of electrons through a circuit. It was the discovery that some semiconductor materials could be doped to have an excess of positive charges or negative charges that provided the breakthrough. A strip of germanium could be doped at each end with differing charges leaving a junction in the middle. The junction worked like a turnstile that could control the flow of current when connected to a battery. Variations in current across these junctions connected in the transistor formation could rectify (prevent current from flowing in both directions) and amplify. That's all that's needed to make a radio (I'm oversimplifying obviously) and hundreds of other devices. Transistors required vastly less current than vacuum tubes, were almost infinitely stable, were cheap and gave off little heat. But, transistors required thousands of connections to the wires coming in order to make a useful circuit, and as demands for more complex circuitry arose the wiring became infinitely complex.

The Chip is a smallish (300 pages) book about the history of the microchip which has lead to miniaturization of circuits that lead to the revolution of the personal computer. The book is easy to read (at times, perhaps too easy as it is lacking some technical details) and insightful. I've enjoyed reading the chip a lot.The book consists of 11 different chapters, each covering an area in the

history of the microchip. The first chapter starts with the invention of "the monolith idea" which is the concept that we integrate all the components on one circuit instead of wiring up different smaller and smaller components. Both Bob Noyce and Jack Kilby had this idea at around the same time and both of them are recognized as the inventor of the chip. The second chapter quickly introduces the history of electronics and the invention of the transistor... all the things that happened before before the monolith idea, the basis for the idea. Chapter 3 is the history of Jack Kilby and chapter 4 is the history of Bob Noyce (nicely done). Chapter five discusses the patent case about whether Noyce or Kilby is the first inventor and how this never really got resolved. Chapter 6 introduces computers and explains how the chip was perfect for making digital computers. Chapter 7 shows how the space race actually provided the demand for the microchips, as there wasn't enough industrial interest yet due to the price. Chapter 8 tells about how (again) Jack Kilby assisted with the invention of the handheld calculator that was the first introduction of the chip to the larger public. Chapter 9 is a bit an odd chapter, it explains how a calculator works.

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