

# BC

## BEFORE COMPUTERS

On Information Technology from  
Writing to the Age of  
Digital Data



Handwritten characters in a cursive script, representing an early form of digital data or code.



Stephen Robertson





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ISBN Paperback: 978-1-80064-029-0

ISBN Hardback: 978-1-80064-030-6

ISBN Digital (PDF): 978-1-80064-031-3

ISBN Digital ebook (epub): 978-1-80064-104-4

ISBN Digital ebook (mobi): 978-1-80064-105-1

ISBN Digital (XML): 978-1-80064-106-8

DOI: 10.11647/OBP:0225

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# Prologue

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I was born in 1946. Somewhere around that time was the beginning of a sea change, often proclaimed as a revolution, one which, in the ensuing three-quarters of a century, has transformed our lives in extraordinary ways. Following the pre-war work by such visionaries as Konrad Zuse and Alan Turing, and the inventive necessities of the war-time code-breaking effort at Bletchley Park, the first working computers (in something close to the modern sense of the word) were just being put together in a handful of laboratories in Britain and the United States. Today computers are pervasive—it is hard to identify any aspect of our lives that has not been affected by them.

But computers are only part of it. We can talk about information technology, or more broadly the information and communication technologies, to encompass computers and the digital world that they have made possible, as well the whole of telecommunications, the internet and the web, sound recording and photography and film, broadcasting, and so on. But immediately we have to call into question what I just said about the start of a revolution. The telephone, for example, predates the computer by maybe seventy years (another lifetime); photography by maybe a hundred. So must we then go back another century to look for the start of this revolution? Or perhaps five more centuries, to the invention of printing?

This kind of question is exactly what this book is about. I think it is undeniable that the period I have lived through has seen revolutionary changes in the domain of information technology. But the word *revolution* suggests a complete break, a hiatus, a rupture with the past. It invites us to define when it happened, and to treat this point in time as a discontinuity.

But like all real revolutions, both the start and the origins of this period of huge change are hard to pin down. My contention is that we had to make many other inventions, to devise or learn many ways of thinking about things or of doing things, before the sea change I have lived through

could come about. What follows is an attempt to pull together into a single story all these necessary precursor technologies, beginning with writing.

This story is not a linear, chronological history. The collection of ideas, of theories, of ways of thinking and ways of doing that have come together under the umbrella of information technology did not start together, either in time or (more importantly) in context. Each strand has its own inception and development; sometimes different strands come together, or one strand splits apart, to follow different historical courses. As a result, I will be jumping about in time, following one strand up to the twentieth century, and putting it aside to go back to the source of another.

Although I have taken the start of the computer age as around 1945, many of the themes that I discuss remained outside the province of the computer or the digital world for much longer. For example, mainstream photography, now absolutely part of the digital world, did not become so until after 1980. In such cases I will follow each theme through into my lifetime, to the point where it is absorbed into or enveloped by this new reality—or perhaps more accurately, until the new ways of thinking and doing expand to include it.

Among the themes that will emerge in a roundabout way is a notion that is key to the modern world—that of *data*. This now all-pervasive idea, which is essentially both the raw material and the product of all computational processes, and encompasses pictures and sounds as well as text and numbers (and a lot of other things), began to emerge explicitly around the start of the twentieth century. It is now hard to think of many aspects of what I will be discussing without this notion in the background. But I invite you to put it aside, at least as far as you can, until Chapter 6.