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## BEFORE COMPUTERS

On Information Technology from Writing to the Age of Digital Data

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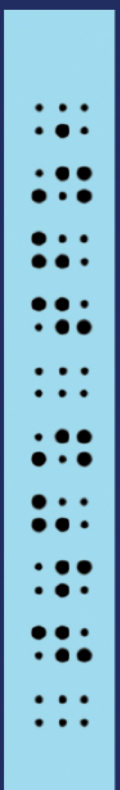

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# Epilogue

We have seen a skein of different ideas, developing over the course of human history, interacting with and feeding off one another, brokered by people with a wide variety of different motivations. We have seen the notion of *data* emerge gradually and gradually absorb many other concepts. Information, which might be seen as an abstraction like *matter* or *energy*, is in some sense "carried" by data, or perhaps may be extracted from it. Numbers are data, text is data, pictures are data, music is data. But that's just the beginning—now everything we do, every interaction we have with any part of the world around us, is data.

Of course this is all absurd. Music (just to take one example) is a human experience, or rather a whole raft of human experiences, and to regard it as data is to ignore or put aside both the nature and the validity of the experience, whether of composing or of performing or of listening. Nevertheless, it is convenient to pretend that music is data, because there is so much we can do with it on the back of that pretence. Not only can we record, store, retrieve, transmit, broadcast music-as-data, we can also make use of any number of digital tools (as well as the slightly older analogue electronic ones) as part of the process of creation, in both composition and performance.

In the twenty-first century, data, data processing and manipulation, and all the raft of technologies around data, are central to how we see the world. In these days of data protection and privacy, of laws and regulations around this domain, of data mining, of data theft, of people and organisations who relentlessly collect data about us and who manipulate us by manipulating our data, and so on—in these days, it is hard to re-imagine the world as it was before the notion of data took hold. The digital computer—together with all the other information and communication technologies—is of course at the core of this data-centred world. Which is why it is tempting to speak of the invention of the computer having ushered in a

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revolution.

So, was it a revolution? Did the arrival of computers result in an overthrow of the existing order of things and its replacement by something fundamentally new?

Certainly, the effect on our lives of the developments in the domain of the information and communication technologies, subsequent to and at least to some extent consequent upon the invention of computers in the 1940s, has been immense, arguably revolutionary. The world of email, the internet, online shopping, online management of bank accounts, mobile phones doubling as cameras, digital radio and television, downloaded recorded sound and films, satellite navigation, ebooks, Google, Wikipedia, social media—all this would have seemed utterly extraordinary, something in the realm of fantasy, to my parents at the time I was born.

Nevertheless, the existing order is seldom so easily cast aside. What this book has demonstrated, I hope, is the extraordinary amount of stuff—of knowledge, understanding, invention, ways of thinking and doing, ideas, methods and techniques—we have brought with us over this journey. In many significant ways, the IT world not only draws on the past, but is rooted in it. This past is not just (though it very much includes) the couple of centuries following the industrial revolution, but goes way back—to the Renaissance, to the invention of printing, to the ninth-century Arabic and seventh-century Hindu mathematicians, to the Roman empire, to the Greeks and the Phoenicians, to the invention of writing itself.