

to sequence DNA ever more efficiently and at lower and lower cost. He describes the technology clearly, almost like a recipe book: you feel you should have *Neanderthal Man* on the bench as you try its techniques for yourself.

Thanks to these developments, scientists are finding many more species of extinct hominin lurking out there in the shadows, betrayed by no known fossil evidence. For example, Denisovans, extinct hominins

"You feel you should have Neanderthal Man on the bench as you try its techniques for yourself."

that lived in Siberia until relatively recent times, are much better known from their DNA than from the tally of their fossils — a small, nondescript finger

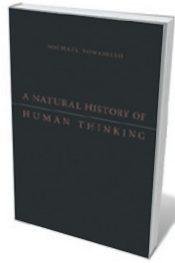
bone and a peculiar tooth. And yet in their DNA are traces of yet another unknown species — glimpsed only as stretches of nucleotides — as evanescent as the smile of the Cheshire Cat.

Pääbo illustrates how the advent of ancient DNA has already had a profound effect on our understanding of human evolution. Skulls and skeletons, once put away in cupboards lest they frighten the undergraduates, are being brought out into the light. Some of these peculiar specimens — such as the skull from Iwo Eleru in Nigeria that looks archaic but is only 13,000 years old — may represent evidence of a richer and much more diverse prehuman history than we are used to thinking about. It has taken the recovery of ancient DNA, not more fossil bones, to jolt us into this wider reality, to force our gaze over a great, unexplored new world.

But as Pääbo recounts, there have been many false positives along the way. He deals harsh judgement on some of the grand claims from the Wild-West phase of ancient DNA research, before secure protocols had been established (and no, we at *Nature* don't escape his searchlight glare). And he does not spare himself from criticism. He looks back on the beginnings of his career in the 1980s, when, torn between a fascination for Egyptology and biochemistry, he mixed the two and tried to extract DNA from an Egyptian mummy. He thought he was making history. What he made was a mess. But, like all true scientists, he never gave up, finding all sorts of ways to achieve his goals, inventing new techniques and new ways of seeing. Eventually, in 1985, he reported the successful cloning of DNA from a mummy, and history was made. ■

Henry Gee is a Senior Editor of *Nature* and the author of *The Accidental Species: Misunderstandings of Human Evolution*.

Books in brief



A Natural History of Human Thinking

Michael Tomasello HARVARD UNIVERSITY PRESS (2014)

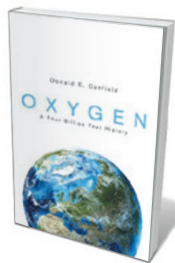
In this prequel to his 1999 *Cultural Origins of Human Cognition* (Harvard University Press), developmental psychologist Michael Tomasello argues that human thinking is unique because it is cooperative. He posits that environmental upheavals forced early humans to channel their thinking towards collective aims through two evolutionary innovations: collaboration while foraging, and the rise of culture as population and competition burgeoned. Tomasello convincingly sets out how "shared intentionality", in which social complexity spawned conceptual complexities, sets us apart.



How Numbers Rule the World: The Use and Abuse of Statistics in Global Politics

Lorenzo Fioramonti ZED BOOKS (2014)

Globally, we love statistics. Indexes and indicators produced by social-science bodies alone number in their hundreds, providing grist for policy mills around the world. In this intelligent study of pervasive quantification, Lorenzo Fioramonti questions its grip on society. Numerical reasoning in overdrive, he argues, can create distorted pictures of real life, amplify the power of markets and sap debate. Packed with cogent analyses of everything from credit-rating agencies to the manipulation of statistics by climate sceptics.



Oxygen: A Four Billion Year History

Donald E. Canfield PRINCETON UNIVERSITY PRESS (2014)

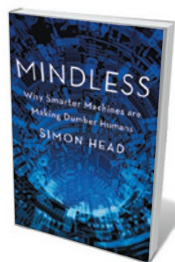
Ecologist Donald Canfield delivers an engaging and authoritative primer on oxygen, that vital element comprising more than one-fifth of our atmosphere. In tracing its 4-billion-year history, Canfield proffers cutting-edge findings on geological and biological questions from deep time. He explores Earth's 'Goldilocks' status; squeezes into the *Alvin* deep-diving submersible to muse on life before oxygen; and probes photosynthesis, the rise of oxygenating cyanobacteria, stabilization of atmospheric oxygen, the 'great oxidation event' 2.4 billion years ago, and the ancient links between organisms and O₂.



Cybersecurity and Cyberwar: What Everyone Needs to Know

P. W. Singer and Allan Friedman OXFORD UNIVERSITY PRESS (2014)

The pace of global digitization, and the widespread lack of understanding of related security risks, is a ticking time bomb. Thus argue P. W. Singer and Allan Friedman in this broad-ranging overview of cybersecurity. They start with basics such as software vulnerabilities, then delve into the implications of and solutions to security breaches, touching on hot issues such as resilience and the controversial use of overlay systems that endow online anonymity, such as Tor. If you don't know your asymmetric cryptography from your spear phishing, this is a thoughtful introduction.



Mindless: Why Smarter Machines are Making Dumber Humans

Simon Head BASIC BOOKS (2014)

'Computer business systems' (CBS) are increasingly embraced in finance, business and health care to monitor the performance of employees digitally — to pernicious effect, argues Simon Head. At a time of deepening inequalities in wealth, he writes, such complex digital control of workplace behaviour disempowers those who can ill afford it. Head presents compelling examples of the impacts of CBS at Goldman Sachs, Amazon and Taiwanese electronics manufacturer Foxconn, among others. [Barbara Kiser](#)