the pain stop) O'Mara recommends an alternative: conversation. Having a conversation with a detainee may yield results comparable, and probably superior, to those obtained from torture. He cites three pieces of evidence.

First is a 1993 study by Stephen Moston and Terry Engelberg of police interrogations, which found that of more than 1,000 detainees, only 5% refused to talk (S. Moston and T. Engelberg *Polic. Soc.* **3,** 223–237; 1993). Second, research by Robin Dunbar and his colleagues finds that 40% of what we reveal in conversation is related to the self, suggesting that refusing to self-disclose is very difficult (R. I. M. Dunbar *et al. Hum. Nat.* **8,** 231–246; 1997). Third, a study by Diana Tamir and Jason Mitchell showed that people are willing to forgo money to talk to others about themselves. Indeed, the nucleus accumbens (part of the brain's reward circuitry) activates during such an opportunity, suggesting that people find disclosure intrinsically rewarding (D. I. Tamir and J. P. Mitchell *Proc. Natl Acad. Sci. USA* **109,** 8038–8043; 2012). O'Mara does acknowledge that the difficulties of having such a conversation with a non-compliant person demand advanced social skills that are comparable to those of clinical psychologists and psychiatrists, who often deal with non-compliant patients. He suggests that alternative approaches such as virtual reality and role playing may be useful for information gathering during interrogation.

"Conversation with a detainee may yield results comparable, and probably superior, to those obtained from torture."

Why then, given its uselessness in eliciting valuable information, do people torture? It is a form of vengeance or punishment, intended to discourage the victim from future transgressions and to communicate to others that harm will not be tolerated. In some cases, it occurs because the torturer believes that terrorists have mental illnesses. In science, however, punishment is not a viable response to someone with such an illness — just as torture is not a viable method for gathering information, as O'Mara repeatedly points out. ■

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Steve Jobs (Michael Fassbender) confronts his daughter Lisa (Perla Haney-Jardine) in *Steve Jobs*.

FRANÇOIS DUHAMEL

INNOVATION

A binary life

A polished biopic of tech titan Steve Jobs fails to plumb fully his inner contradictions, finds **Timo Hannay**.

The closest I came to meeting Steve Jobs was in the late 2000s, shortly after the birth of the iPhone. I was attending Foo Camp, a California mustering of digital demigods. Jeff Bezos of Amazon was a regular; the year before, Google co-founder Larry Page had turned up in his helicopter. Everyone but me took such things in their stride. That year, however, there was something different in the air: a rumour had spread that Steve Jobs himself might join us. He never showed up, but such was his unique status that even his absence generated more excitement than the presence of other tech giants.

Blessed as he was with formidable taste and rock-star showmanship, Jobs was always going to stand out from the crowd of awkward nerds (like me) who populate much of the technology landscape. Add to this his death at the height of his powers, and we have all the ingredients of a legend. This is not undeserved. Many technologists talk of changing the world; Jobs actually did so. More than anyone else, he broke down the barriers between technology and humanity, helping to turn computers into consumer products. Then, with the iPhone, he pulled off the reverse, turning an established consumer product into a computer.

Steve Jobs
WRITTEN BY AARON SORKIN
DIRECTED BY DANNY BOYLE
Universal: 2015.

How best to understand such a life? Jobs's answer was to invite high-flying writer and former media executive Walter Isaacson to pen his biography — a superb account published within days of Jobs's death. *Steve Jobs* (Simon and Schuster, 2011) is likely to remain the closest we will ever get to a definitive account.

The film version of Isaacson's blockbuster is a highly competent creation — as you would expect from writer Aaron Sorkin (*The Social Network*, *The West Wing*) and director Danny Boyle (*Slumdog Millionaire*, *Trainspotting*). The dialogue zips along at 100 beats per minute; the acting (especially by Michael Fassbender in

the title role) is at times outstanding; and the direction is as slick as that of any other Hollywood offering. Yet many people will watch this film to better understand its subject — and by that measure, it falls short.

The plot hinges on Jobs's relationship with his daughter, Lisa Brennan-Jobs, and plays on the contrast between his lavishing of obsessive attention on his latest electronic brainchild and his ignoring, or disowning, of his flesh and blood. It does this by going backstage at three seminal product launches: those of the Macintosh in 1984, the NeXT Computer in 1988 and the iMac in 1998. This convenient three-act structure, which catches Jobs at three key moments in his life, also serves as a metaphor for the contrast between his suave public persona and his chaotic life.

This leaves a lot out. And therein lies the main weakness of this film: there are umpteen other contradictions to explore in Jobs. He was simultaneously a hippy and a control freak. He was an ascetic drawn to mysticism who built the world's preeminent consumer-products company. He was egocentric and impossible, inspiring both incredible feats of engineering (starting with the design of the Apple II by co-founder Steve Wozniak) and deep affection (despite frequently taking credit for the work of Wozniak and others).

Of course, covering all this ground in a two-hour film would be difficult. But the setting means that Jobs's close colleagues, relatives and key antagonists must all be at the launches with him, wanting to discuss their gripes in the same few minutes before he is due to step on stage. (In one amusing 'meta' moment, Fassbender actually notes precisely this.) This frequently stretches credibility too far.

The first two-thirds of the film thus struggle to engage — and will probably confuse people unfamiliar with the story and the cast of characters. It includes plenty of wonderfully quotable lines and aphorisms from the book, such as Jobs's burning desire to "put a dent in the universe". But the rat-a-tat-tat form feels more like a collage than a coherent narrative. In short, it could have done with a dose of Jobsian minimalism. That said, the film redeems itself in the third act — rather like Jobs's career.

If you want an impressionistic, almost dreamlike montage of key moments in Jobs's life, see *Steve Jobs*. If you want to understand Jobs the man, you will be disappointed. But see the film anyway: it makes a great trailer for the book. ■

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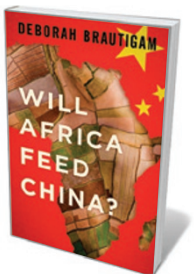
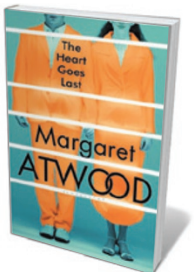
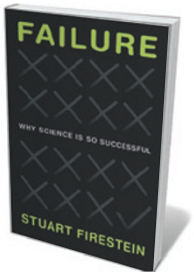
Books in brief



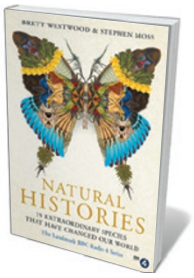
Will Africa Feed China?
Deborah Brautigam OXFORD UNIVERSITY PRESS *(2015)*
Starting in 2008, China — with more than 20% of the global population and just 9% of the arable land — was said to be buying up swathes of African farmland. In her cogent analysis, international-development specialist Deborah Brautigam cuts her own swathe through myths about this relationship. She marshals fresh case studies to reveal that Chinese companies own just 250,000 hectares of African land, while the country has no government policy on overseas farming. Far from being the first ripple of an imperial storm, she argues, Chinese interests in Africa largely follow in Western footsteps.



The Heart Goes Last: A Novel
Margaret Atwood BLOOMSBURY *(2015)*
Stan and Charmaine struggle to survive in a squalid, lawless near future. The Positron Project, a social experiment in which they spend alternating stints in prison and suburbia, seems to offer a way out — at first. Doyenne of speculative fiction Margaret Atwood is on grimly hilarious form here as tour guide to a macabre society given over to unregulated science, social cleansing, identity loss and profiteering. She prods satirically at issues from industrial farming (headless-chicken production aimed at "meat growth efficiencies") to sexbots, and even fits in a subplot featuring a horde of Elvis impersonators.



Failure: Why Science Is So Successful
Stuart Firestein OXFORD UNIVERSITY PRESS *(2015)*
Biologist Stuart Firestein's energetic sequel to *Ignorance* (Oxford University Press, 2012) explores the centrality of failure in the scientific endeavour. Naturalist Ernst Haeckel's erroneous ideas about ontogeny and phylogeny, for instance, helped to spawn the field of embryology. Firestein ranges widely, looking at failure in contexts ranging from pharma to funding. At base, however, this is a close examination of how repeated failure refines problems, clarifying the way forward — a challenge that in turn sparks the courage and clarity of mind needed for incisive investigation.



Natural Histories: 25 Extraordinary Species That Have Changed our World
Brett Westwood and Stephen Moss JOHN MURRAY *(2015)*
Based on an eponymous BBC Radio 4 series, this collaboration with London's Natural History Museum explores the biology and cultural histories of selected flora and fauna. Naturalist Brett Westwood and writer Stephen Moss present an idiosyncratic list, including mandrill, oak, coral, cockroach and whale. Out of myriad gripping stories, their take on the lion resonates: the imposing beast may be a cultural ubiquity, yet African populations have diminished catastrophically from 400,000 in 1950 to fewer than 30,000 today.

Breaking the Chains of Gravity: The Story of Spaceflight before NASA
Amy Shira Teitel BLOOMSBURY SIGMA *(2015)*
In this straightforward chronicle, science journalist Amy Shira Teitel traces NASA's 'prequel'. However familiar, the early discoveries of rocketeers such as Romanian physicist Hermann Oberth still thrill, as does (in a very different way) the crucial input of former Nazi and rocket designer Wernher von Braun. Teitel delivers on detail, such as the exploits of supersonic-flight pioneer Chuck Yeager; but the whole needs more synthesis and never quite soars. **Barbara Kiser**