replaced the rhythms of nature with those of the production line. It was also a time of revolution and mechanized warfare. Against that backdrop, the word 'robot' was born in Czech writer Karel Čapek's 1920 play *R.U.R. (Rossum's Universal Robots)*. In the very work coining the term, the robots rebel against and destroy their creators. And that narrative of rebellion has proved to be the most potent of all our AI fears, retold repeatedly as technology evolves.

During the cold war space race, the film *2001: A Space Odyssey* (1968) gave us HAL 9000, the murderous spaceship supercomputer. With the rise of the Internet, we got Skynet — a defence network that becomes self-aware in the Terminator films (starting in 1984) — and *The Matrix* (1999), featuring intelligent machines that farm humans whose minds unknowingly inhabit a virtual reality. Now, with AI dominating headlines, we have sophisticated robots again overthrowing their wetware masters, from Ava in the 2015 film *Ex Machina* to the android amusement-park hosts in the *Westworld* television series.

"The tension lies in our conflicted desire to create beings superhuman in capacity, but subhuman in status."

The persistent trope of robot revolts reveals the paradox at the heart of our relationship with intelligent machines. We want to create clever tools that can do everything we can do, and more. They will be the perfect oracles, servants, soldiers, even lovers. To fulfil our hopes, they must have attributes such as intellect and agency — minds of their own, superior to ours. But, paradoxically, that is also why we fear HAL and Skynet. The tension lies in our conflicted desire to create beings superhuman in capacity, but subhuman in status.

Our hopes continually threaten to collapse into such fears, but we hope nevertheless. Every robot rebel has its benevolent counterpart, such as C-3PO in the Star Wars franchise or the android child David in Steven Spielberg's 2001 film *A.I. Artificial Intelligence*. Both kinds of stories, the hopeful and the fearful, reveal to us our complex emotional responses to AI. Understanding these and their deep history is crucial to making the most of life with intelligent machines. ■

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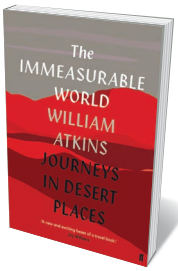
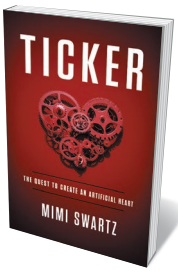
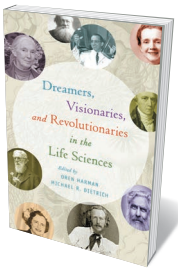
Books in brief



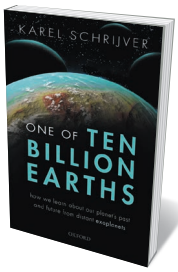
The Immeasurable World
William Atkins FABER & FABER *(2018)*
An "axis where the absolute coexists with the infinite": so William Atkins sees the quintessence of deserts. He searched for it on seven journeys, from the Arabian Peninsula's 'Empty Quarter' to China's Gobi Desert, recollecting his arid odyssey in this beautifully observed memoir-cum-natural-history. With him, we tread the grit of old atomic test sites in Australia's Nullarbor Plain; meet fatalistic migrants at Arizona's Mexican border; and contemplate the bleak ecodisaster of Central Asia's disappearing Aral Sea. "The world has been done," Atkins declares. But he sees it with new eyes.



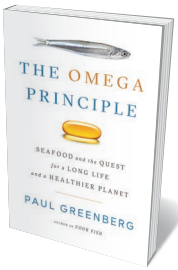
Ticker: The Quest to Create an Artificial Heart
Mimi Swartz CROWN *(2018)*
In this pacy, blow-by-blow account of the search for a viable artificial heart, *Texas Monthly* executive editor Mimi Swartz offers a vivid gallery of the medical pioneers who have jostled for the prize. Here are heart surgeon O. H. 'Bud' Frazier; inventors Robert Jarvik, Billy Cohn and Daniel Timms; and cardiac specialists Michael DeBakey and Denton Cooley, whose duel over implanting the first crude devices sparked the crusade. Decades later, that quest remains urgent: more than 25 million US citizens have heart disease, yet only a few thousand hearts are available for transplant in any given year.



Dreamers, Visionaries, and Revolutionaries in the Life Sciences
Oren Harman and Michael R. Dietrich (eds) UNIV. CHICAGO PRESS *(2018)*
They may infuriate even as they inspire; destabilize, as well as advance. The visionaries of biology, note science historians Oren Harman and Michael Dietrich, are masters of "dramatically bold, even fantastic" thinking about big problems. This compelling edited volume explores the work of 19 innovators, including Iranian-American cancer researcher Mina Bissell, who studies tumour microenvironments; Canadian John Todd, who engineered solar aquatic sewage treatment; and Peter Kropotkin, the Russian biologist who championed mutualism in nature during the Darwinian revolution.



One of Ten Billion Earths
Karel Schrijver OXFORD UNIV. PRESS *(2018)*
Like distant mirrors, exoplanets reveal much about Earth and its habitability even as they relay explosive new insights into planetary formation and extraterrestrial life. Astrophysicist Karel Schrijver's lucid, fact-packed primer ranges over everything from the Goldilocks zone and stellar nurseries to disrupted exosystems and the vagaries of "living on a pale blue dot". And more: if you ever wanted to understand nomad planets or catch a glimpse of a volcanic eruption on Jupiter's moon Io (observed by the New Horizons spacecraft on its way to Pluto), this book delivers the goods.



The Omega Principle
Paul Greenberg PENGUIN *(2018)*
The cacophony of claims about the impact of omega-3 fatty acids on health is drowning out concerns over the associated industry, argues Paul Greenberg in this sobering investigation. He followed the omega-3 trail around the world and into history to reveal the price of a century of industrial reduction — the boiling down of a gargantuan tonnage of marine organisms for products from animal feed to oils for supplements. Notably, the mass harvesting of krill and forage fish such as menhaden looks increasingly unsustainable as overfishing and oceanic warming take their toll. **Barbara Kiser**