

growth, leading to inequality and strife.

Turchin has been compared to Hari Seldon, science-fiction writer Isaac Asimov's "psycho-historian", who studies the past to statistically predict the future. He belongs to a new breed of scientific historian taking a big-data approach, and argues – controversially – that societal spasms are cyclic. This idea itself comes and goes: the ancient Greeks took the cyclic nature of history for granted, but it has been unfashionable since the Enlightenment. Today, we tend to have a linear concept of progress, in which life generally improves for most people over the long term. Works such as Turchin's see this trend as superimposed on an inherent cyclicity in the evolution of societies.

## Reboot cycle

This raises the question of whether collapse is essential to renewal. Without winter, can you have spring? Bardi says no. Whether you think this good or bad depends partly on your point of view. The mass extinction 66 million years ago was bad for dinosaurs, but good for mammals, sociologist Miguel Centeno observed at the Princeton workshop, which he convened. But if collapse could usher in not only a renewed world, but a better one, shouldn't we dinosaurs embrace it?

For Turchin and Jack Goldstone – on whose work on the demographic forces shaping history Turchin builds – this is good advice only if you understand what causes collapse. Then it might be possible to make the transition less violent or disruptive. Goldstone rigorously dissected upheaval in the sixteenth to the nineteenth centuries in his 1991 book *Revolution and Rebellion in the Early Modern World*. This convinced him that revolution is an inappropriate response to societal tensions, usually leading to tyranny. Solutions have come instead from deep, meaningful reform. Yet the idea that revolution removes obstacles to progress has "deluded literally billions of people", he argues.

An interdisciplinary community of researchers is now searching for patterns that have defined collapse throughout history, to determine what might be an appropriate response. If we can't and shouldn't prevent a future crisis, could we at least soften it – perhaps with the help of new technologies – so that renewal happens, but less is lost and fewer people suffer? Even if the mind-boggling complexity of human societies makes this a pipe dream, as some argue, it seems a sounder approach than sparring over case studies that might not have constituted collapse at all. Speaking as a dinosaur, whose only alternative is to panic and freak out, I'll take it.

**Laura Spinney** is a science writer based in Paris. Her most recent book is *Pale Rider: The Spanish Flu of 1918 and How it Changed the World*. e-mail: lspinney@gmail.com

## Books in brief

### CURED

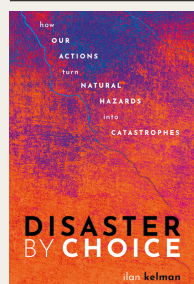


The Life-Changing Science of Spontaneous Healing  
JEFFREY REDIGER, MD

#### Cured

Jeffrey Rediger Flatiron (2020)

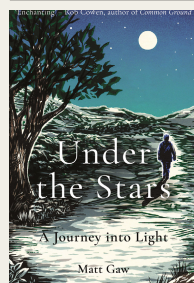
An experienced physician who is also a skilled, driven and compassionate writer is a winning combination. This pioneering book by psychiatrist Jeffrey Rediger analyses unexplained spontaneous recoveries from potentially fatal medical conditions, including cancer. From interviewing patients over nearly two decades, Rediger concludes that each recovery was "unique" and only partially explicable, but that all provide evidence of "a powerful link" between our identities and our immune systems.



#### Disaster by Choice

Ilan Kelman Oxford Univ. Press (2020)

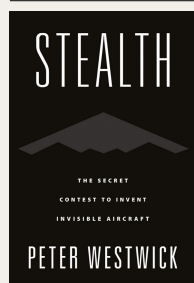
Human choices cause disasters, but can also prevent them, argues Ilan Kelman in this grimly informative history. A specialist in disasters and health, he surveys earthquakes, epidemics, floods and more in a range of countries. Thus, in 2010, a magnitude-7.1 earthquake near Christchurch, New Zealand, caused not a single death. The same year, a magnitude-7.0 quake in Haiti caused at least 100,000 fatalities and a cholera outbreak – because of poor buildings and health care. Scientific foresight and political will are always key to resilience.



#### Under the Stars

Matt Gaw Elliott & Thompson (2020)

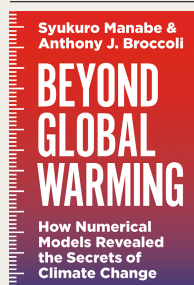
The Milky Way is invisible to 77% of today's UK population because of artificial light, notes naturalist and journalist Matt Gaw: "Many adults and children, my own included, have never seen it." Such thoughts inspired this poetically written but scientifically grounded study of darkness and its effect on humans and wildlife. Gaw describes night wanderings on English beaches, across Dartmoor and in central London. On the Scottish island Coll, a Dark Sky Community without a single street light, his children were entranced by the stars.



#### Stealth

Peter Westwick Oxford Univ. Press (2020)

In 1961, Dwight Eisenhower warned in his last address as US president that the "military-industrial complex" must be checked for the sake of "security and liberty". Historian Peter Westwick is more positive in his incisive narrative of the top-secret 1970s invention and construction of the stealth plane F-117. Nearly invisible to Soviet-designed radar, it was used to crucial effect in the 1991 Gulf War. Westwick argues that it offered an alternative to nuclear weapons, but admits that "to defend American liberties, aerospace engineers gave up civil liberties".



#### Beyond Global Warming

Syukuro Manabe & Anthony J. Broccoli Princeton Univ. Press (2020)

The first global climate model, developed in 1896 by chemist Svante Arrhenius, included the warming effect of atmospheric carbon dioxide. In the 1960s, meteorologist Syukuro Manabe pioneered computer simulation of climate change. Manabe's book written with atmospheric scientist Anthony Broccoli has evolved from his lecture notes, with chapters on, for example, general circulation models. Although technical, it should prove useful to those wishing to understand global warming's future impact. **Andrew Robinson**