

## Books & arts

research on babies gestated during the Dutch Hunger Winter famine of 1944–45.

The ice-storm studies looked at only 34 children, and had no control group. The Holocaust work had only eight parental controls and nine offspring controls. The Dutch studies involved 811 offspring — a large enough sample size, including plenty of controls. Yet Richardson points out that the effect sizes they found were low: differences in DNA methylation levels of between 0.7% and 2.7%. None of the studies took biological samples from the children at birth. Without those, Richardson argues, they can't rule out 'reverse causation'. In other words, they can't pin down whether epigenetic changes caused, say, increased susceptibility to stress, or whether susceptibility to stress caused the epigenetic changes.

Epigenetics studies typically use blood samples, but epigenetics varies by cell type, so if you're interested in effects in the brain, it's not clear that you would learn anything from changes in blood. And studies rarely collect much, if any, information about paternal contributions to the studied effects. One theory holds that maternal obesity during pregnancy causes higher rates of obesity in children; studies that expanded the research have found that paternal size explains the variation better.

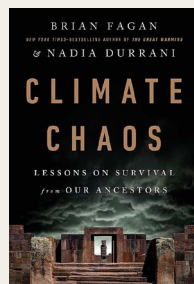
Richardson makes many good points, but references and counterpoints are too thin on the ground. Most problematic, she doesn't engage with the growing body of work designed to address some of the gaps in the Dutch studies — efforts such as the Avon Longitudinal Study of Parents and Children in the United Kingdom, and at least seven others covered by the Pregnancy And Childhood Epigenetics Consortium that have sample sizes in the thousands and collect umbilical-cord blood to address reverse causation. Richardson never explains how she selected the three groups of studies that she focuses on to the exclusion of others.

Her key contention is that weak epigenetic findings can exert too tenacious a hold because our culture teaches us to assume that mothers bear responsibility. It's true — women are much too easy to blame. But to make a strong case, other interpretations need to be addressed, such as the general frenzy for DNA-based explanations, or the cult of personal over societal responsibility.

Richardson is right, however, about how cultural assumptions diminish possibilities. As public-health specialist Liana Winett has written: "Asking, 'What would a woman do today if she wanted to help her baby avoid chronic disease?' is very different from, and much more limiting than asking, 'What would our society do and provide if we wanted to be the healthiest place to be born?'"

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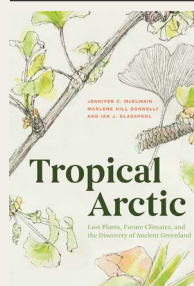
## Books in brief



### Climate Chaos

Brian Fagan & Nadia Durrani *Public Affairs* (2021)

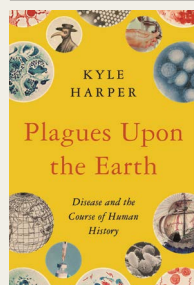
Earlier civilizations' responses to natural climate shifts are often assumed to be irrelevant to the current crisis. Not so, argue archaeologists Brian Fagan and Nadia Durrani in their rich survey of the past 30,000 years. A global drought from 2200 to 1900 BC first destabilized Egypt, then strengthened it, after pharaohs in supposed divine control of the Nile were replaced by provincial leaders who invested in dams and irrigation. Egypt's "organized oasis" flourished for two millennia, becoming ancient Rome's granary.



### Tropical Arctic

Jennifer C. McElwain et al. *Univ. Chicago Press* (2021)

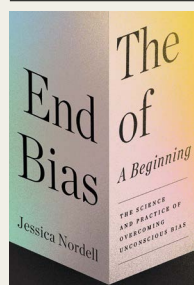
Ice-covered Greenland was named misleadingly by tenth-century Norse settlers hoping to attract others. But at the time of the dinosaurs, the label would have been accurate, judging from the fossilized plants intricately reconstructed and pictured in this fascinating study by palaeobotanists Jennifer McElwain and Ian Glasspool, with scientific illustrator Marlene Donnelly. They warn that current greenhouse-gas emissions are becoming comparable in impact to the volcanic emissions that triggered the collapse of Triassic Greenland's flora.



### Plagues upon the Earth

Kyle Harper *Princeton Univ. Press* (2021)

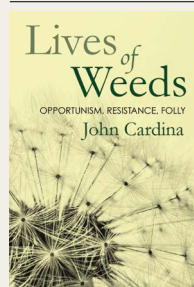
Classicist Kyle Harper's absorbing global history of disease from prehistoric times to today emerged from a study of ancient Roman plagues. Their details left him asking why the empire suffered giant epidemics; why these particular diseases; and why then? He explores how human history has shaped disease ecology and the evolution of pathogens, and vice versa — both predictably and unpredictably. The COVID-19 pandemic is part of this "deep pattern", he concludes: "expect the unexpected".



### The End of Bias

Jessica Nordell *Metropolitan/Henry Holt* (2021)

When she was trying to break into journalism, Jessica Nordell had no response from editors — until she used a man's name on her pitches. Her first book (shortlisted for the 2021 Royal Society Science Book Prize) skilfully and sensitively explores ways to eradicate bias in society and oneself. Interviewing cognitive scientists and social psychologists, mostly in the United States, she covers a huge range of methods, such as doctors' diagnostic check lists for gender equality, and a police unit practising mindfulness to diminish its use of force.



### Lives of Weeds

John Cardina *Cornell Univ. Press* (2021)

Of the roughly 400,000 species of flowering plants, how many are weeds? The answer depends on who, where and when you ask. "One person's weed is another's wildflower, food or medicine," notes plant ecologist John Cardina; think of cannabis. His penetrating analysis disentangles botany from history by offering eight interwoven stories, each focused on one weed, some familiar, others less so: dandelion, Florida beggarweed, velvetleaf, nutsedge, marehail, pigweed, ragweed and foxtail. **Andrew Robinson**