



The perils of not thinking ahead

Despite the title, Martin Rees's new book *On the Future: Prospects for Humanity* is not really about predicting the future. Instead, it is about getting us to pay attention to and build our priorities around what is down the road. Much of the book is an ode to how bad we are, as a species and a civilization, at thinking ahead. Rees, the UK's Astronomer Royal, argues that there is now an "explosive disjunction" between the time scales of human social and technological development and natural processes. And Rees is surely onto something—his earlier book *Our Final Century? Will the Human Race Survive the Twenty-First Century?* (2003) was for its American edition renamed *Our Final Hour: A Scientist's Warning: How Terror, Error, and Environmental Disaster Threaten Humankind's Future in This Century—On Earth and Beyond*, presumably to make the time scale seem pressing to present-minded readers.

On the Future does spend some time prognosticating, although Rees warns that he is writing as much as a worried citizen as a scientist. He doesn't include many predictions from his own fields of astronomy and physics—he says don't stress about asteroid impacts, and he would like particle physicists to lay off experiments

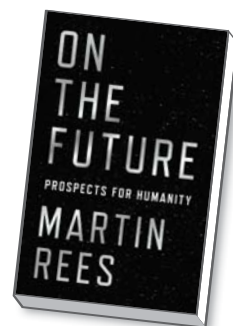
that might destroy the planet—though he does present rich images of a time when humans and their machines will fill the vastness of space.

Most of the predictions he discusses are of the eco-threat variety. Our actions in the next century, he writes, will determine the course of the planet for thousands of years. He is actually fairly optimistic that science and technology can create a future that is benign rather than catastrophic. The problems, he contends, are essentially political, not technical, and thus his expertise as a scientist is of limited value for predicting our actual future. Unfortunately, the Schrödinger equation is of little help in foreseeing what the US Senate will do next.

Rees is remarkable in his modesty. Books of this sort tend to be exercises in deploying the author's specific expertise as strongly and widely as possible. Not here. The final section of *On the Future* is the author reflecting on the limits of science and how those limits should shape the way scientists think about their social role. Drawing from his long and storied career, Rees slays a number of sacred cows. He rejects the idea that scientific reasoning is particularly elite. He denies that the scientific community is monolithic and

On the Future
Prospects for
Humanity

Martin Rees
Princeton U. Press,
2018. \$18.95



unified. He trounces reductionism. He calls for peaceful coexistence of science and religion. He accepts the possibility that there are some things about the universe that scientists will never know.

All of those arguments are small steps toward his conclusions about how scientists should function in society. Rees does not want an elitist model in which scientists make decisions and everyone else simply accepts them. Rather, he wants decisions to come from public debate. For that to happen, though, the public needs a "feel" for the key ideas of science so they won't be "bamboozled." He says that scientists need to engage with the public in a substantial way and that they should not be afraid to take strong positions on issues—his models are Hans Bethe, Rachel Carson, and Carl Sagan.

Rees argues that at the end of the day, the goal should be to get politicians to create good policy, though he doesn't think much of scientists being formal ad-

visers to leaders. Instead, he suggests that addressing the public is a more powerful tool for influencing politicians. Rees believes that we can build a good future in which science and technology will be essential, but that future cannot be created by scientists alone. They need to be guided by ethics that science itself cannot provide.

On the Future is a short, lively book that summarizes many of the positions that the Astronomer Royal has taken over the years. It is written in a compelling style and has little jargon. Its brevity,

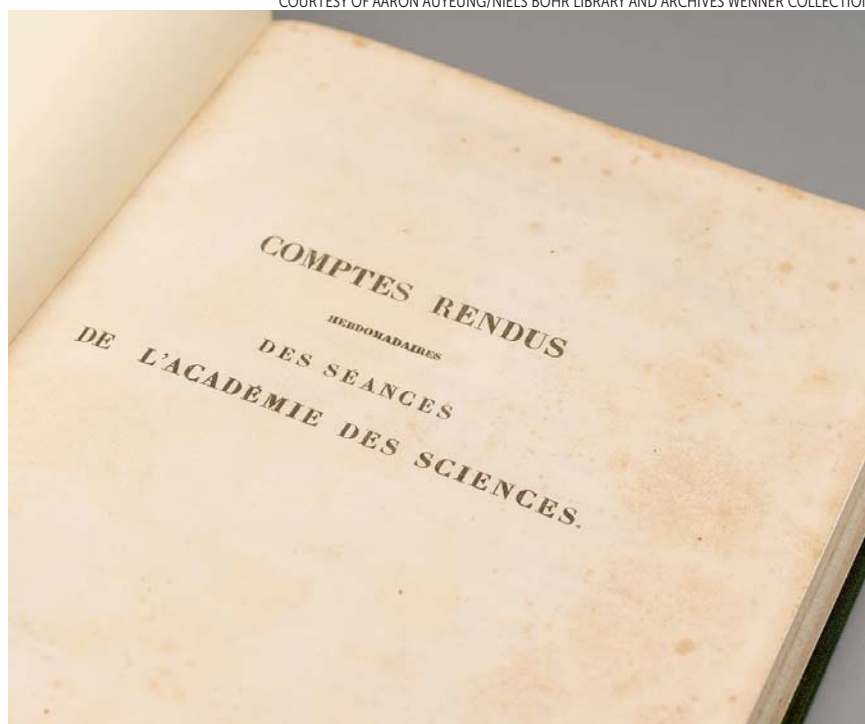
though, means it does not go into detail on many of the scientific issues, so it will perhaps be more appreciated by those with some previous knowledge of, say, climate change.

The book's great contribution is placing those scientific issues in the context of modern society's difficulty with thinking beyond today. Intergenerational justice—how much we are willing to let our grandchildren suffer for our own benefit—is not a subject in which scientists are typically trained. But Rees says it should be. He wants everyone in the lab

to think about the implications of their work and to try and guide that work to beneficial goals. If our civilization ends in catastrophe, he writes, it will not be the fault of science. It will be the fault of how we think about science: Can we ponder its implications over centuries, or are we stuck in the next hour? Rees's book is a warning that we are at a crossroads. Which path we take depends on whether we choose to think long-term.

Matthew Stanley
New York University
New York City

COURTESY OF AARON AUYEUNG/NIELS BOHR LIBRARY AND ARCHIVES WENNER COLLECTION



Writing the record of scientific knowledge

The Wikipedia entry for PHYSICS TODAY states that the esteemed publication you are currently reading is “scientifically rigorous and up to date.” However, the entry explains, the magazine “is not a true scholarly journal in the sense of being a primary vehicle for communicating new results.”

The careful inclusion of that distinction

points to some important assumptions about what constitutes a “true” scientific journal. As historian of science Alex Csiszar observes in the introduction to his book *The Scientific Journal: Authorship and the Politics of Knowledge in the Nineteenth Century*, readers expect a great deal of those periodicals. They are “both permanent archive and breaking news,

The Scientific Journal Authorship and the Politics of Knowledge in the Nineteenth Century

Alex Csiszar
U. Chicago Press,
2018. \$45.00



both a public repository and the exclusive dominion of experts, both a complete record and a painstakingly vetted selection.” Csiszar’s book explores how the scientific journal came to embody those apparent contradictions and demonstrates why we have made that particular medium the preeminent mode of communicating claims to knowledge.

Tempting as it is to draw a direct line between the establishment of the *Philosophical Transactions of the Royal Society of London* in 1665 and the 21st-century peer-reviewed scientific journal, recent historical scholarship has increasingly shown that the narrative is far more complicated. The rise of the scientific journal was the result of the interplay of political and commercial forces in post-Enlightenment Europe. Csiszar meticulously traces the development of journals in Britain and France during the 19th century, and he shows that shifting and competing ideas about scientific audiences and authors led to significant changes in the way scientific researchers engaged with print.

At the beginning of the 19th century, academies and learned societies were the